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THE STRUCTURE OF LABOR MARKET SEGMENTATION OF OCCUPATIONS: SOME EVIDENCE FROM FACTOR ANALYSIS

By

Robert C. DauffenBach

February 19, 1973

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ABSTRACT

In this document the empirical results of a factor analysis of labor market attributes of occupations are reported. The purpose of the analysis is to determine the principal structures of the occupation-labor market attribute domain enabling a more objective construction of "occupation systems" for use in labor market and manpower research. Nine principal structures of labor market segmentation are delineated and interpreted. Suggestions for application of the results are made. Sample base for this investigation was the detailed occupational categories of the 1960 Census of Population.

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I. INTRODUCTION

Since the nineteenth century pronouncement by Cairnes [3] of the "non-competing groups" concept, social scientists have become increasingly interested in the basic anatomy of labor market segmentation. In recent years attention has focused on the specialized employment problems of blacks, women, young and older workers. Studies of "bifurcation" of the labor market into "peripheral worker" versus "full-time:full-year" employment, the work experience of minority groups, youth and female employment patterns and black/white income and unemployment differentials are but a few examples of renewed interest in labor market segmentation.

In contrast to the large majority of past labor market studies which concentrated on various demographic groups, it is the purpose of this investigation to explore the structure of labor market segmentation with respect to occupations. The empirical methodology of "factor analysis" is the basic research tool of this study. The overall goal is to increase the relevance of occupational statistics to labor market research through knowledge of the labor market structure of occupations and, thus, to facilitate the development and construction of "occupation systems." This report is initiated by a brief discussion of occupation systems and their place in labor market and manpower research. A more complete statement of the "research question" of the investigation is then presented. Thirdly, the variables employed

in this investigation and the occupational sample base will be stated. Fourthly, the general nature of factor analytic purpose and method and, particularly, one subset of these methods, the "principal component model," will be discussed. The above is followed by the empirical results and interpretation of the basis dimensions of labor market segmentation. In the "summary and conclusions" section some implications and applications of the findings of this study for future labor market research will be given.

II. OCCUPATION SYSTEMS

Initial research in the area of occupation systems, generally attributed to Alba M. Edwards [4], was structured on a theme of "socio-economic groups." The intent of such a classificatory scheme was to "bring together into one occupationally homogeneous group all workers belonging to the same social-economic class, with but minor regard to the occupations they pursue...." [5, p. 175]. This theoretical base, now considerably scathed by repeated academic attacks [2] [8] [12], has dominated the summary classifications of Census occupational tabulations to date. From these summary classifications, sweeping generalizations on compensation, unemployment, education and other differentials between aggregate classifications have been made and, admittedly, some light is cast on basic labor market segmentation through their use. Yet, the inadequacy of the theoretical base by which the detailed categories are aggregated substantially limits their usefulness in specialized research investigations.

As evidenced by review of occupational classification literature, there clearly exists a need for sophisticated occupational systems for purposes of labor market and manpower research. Objective criteria are necessary for construction of such systems. Thus, Scoville has developed a reclassification of detailed occupations along "job family" and "content level" lines [11]. Broom and Smith have suggested the structure of a system based on the inherent potentiality for mobility of individuals in particular areas of endeavor [1]. Cain, Hansen and Weisbrod view "cross-elasticities of supply" and "elasticities of substitution" between occupations as the proper conceptual bases for demarcation of such a system [2]. These examples of varying (although interrelated) objective criteria are formed from dominant themes of the occupational structure deemed appropriate for classificatory purposes.

There are, of course, a multitude of other objective criteria which could be employed in the construction of occupation systems. Age, sex, race, education, earnings and other labor market attributes of occupations could each serve as objective criteria for construction of such a system. Or, one may seek a "structural patterning" of such variables as a basis for aggregating the detailed categories. As is aptly stated by Scoville:

> The underlying pattern of jobs in the economy influences and is interrelated with other variables relevant to manpower and labor market research. These include educational and training requirements, worker mobility and movement, the structure and distribution of compensation, and even the age and sex characteristics of employment. *If we are to have relevant and analytically useful data, they should be constructed with a view toward this general system of relationships between jobs and other labor market and manpower variables* [12, p. 317]. (Italics Added)

An increased understanding of this "underlying pattern" or dimensionality of occupations with respect to relevant labor market variables could serve as an additional tool for development of an occupational system of greater relevance to current specialized research endeavors. It is the purpose of this paper to further explore the basic lines of segmentation of detailed occupations with respect to relevant labor market attributes with hopes of serving the general goal of improving the usefulness of the detailed occupational categories for purposes of manpower and labor market research.

III. THE RESEARCH QUESTION

The basic research question of this investigation is stated as follows: What are the major, linearly independent, basis dimensions of labor market segmentation that span the occupation--labor market attribute space? Somewhat less technically, the objectives are delineation and identification of the principal structures or common themes of labor market segmentation that concisely define the systematic variation in a data matrix of occupations by labor market variables. Each of these basis dimensions is merely a linear combination of labor market attributes and as such, each can be viewed as a separate "structural meshing" of those attributes.

To further illustrate this concept of basis dimensions, consider a hypothetical example of two sets of labor market attributes such that there are strong interrelationships among variables within sets but no relationships among variables between sets. Each set of variables is, then, delineating a principal structure of the attribute space.

Through a linear combination of the variables in the first set, form a new variable, S_1. Similarly, S_2 is constructed by taking a linear combination of variables in the second set. By assumption, S_1 and S_2 are not related and, thus, they are basis dimensions of the attribute space. Each contains a concise embodiment of one form of systematic variation in the original attribute space. These basis dimensions are said to "span" the attribute space in that any attribute vector can be reproduced by a linear combination of the basis dimensions. In practice, variables do not neatly divide into distinct sets as in the above hypothetical example; therefore, all variables will make a contribution to each of the basis dimensions. Of course, the contributions of the variables to a given dimension will vary. In fact, identification of the content of any given dimension is facilitated by assessment of the relative contribution of the variables to the dimension.

IV. THE DATA MATRIX

Although the data on occupations are not as rich as students of labor markets would have them, there does exist a large body of tabulations pertaining to earnings, education, weeks worked in the previous year, hours, age, sex, race and marital status. Other relevant variables can be computed from the tabulations such as "unemployment rates." The profile variables selected for use in this study are as follows: percentage values for male, white male, white female, married, married male; unemployment rates: total, male, female, white, non-white; not-in-labor force ratios: male, female, total; and, percentage frequency distributions

of earnings, years of education, weeks worked, hours and age on which there are, respectively, ten, seven, five, eight and eleven classificatory breakdowns. Use of percentage frequency distributions on the last five groups of variables was decided so as to more accurately account for the variance, skew and sometimes bimodality of the distributions. This information is lost if a simple central tendency measure is employed. All variables were transformed to normality by a "grouping" procedure such that all means and variances were zero and one, respectively. The base on all variables was "experienced civilian labor force" except for "hours" and "age" for which and "employed" base was utilized.

Perhaps the only variable in need of an accounting of its construction is the "not-in-labor force ratio" (NLFR). For any given occupation at any point in time there exists a stock of "former workers" who had that occupation as their "last job" and who are non-participants in the labor force. "NLFR" is calculated by simply dividing this total by the "experienced civilian labor force" for the occupation. It would, of course, be hypothesized that "NLFR" would be a direct function of the "marginality" of an occupation, i.e., occupations of a part-time:part-year nature. In a sense, "NLFR" measures the interaction between "not-in-labor force" status and occupational supply. It is necessary to qualify this last statement since measurement of "NLFR" is one directional: from occupation to "not-in-labor force" status, not the reverse. Also, there is no data on the intervening period of unemployment of such workers. In computation of this ratio, "former workers" for 1959 and 1960 were summed to form the numerator.

A number of qualifications on the data and variables are in order. Census reliability tests show substantial departures from acceptable levels of response variations in categorizing individuals into their proper occupational class. Also, general homogeneity of the detailed categories with respect to the job titles encompassed within each respective detailed occupation has been severely criticized in the literature. Furthermore, the cumbersome size of the "not elsewhere classified" categories raises questions as to the general worthiness of the data. Particular to this research endeavor, use of the detailed occupational categories and a further industrial disaggregation of some of the larger "N.E.C." classifications, which together resulted in 348 cases, creates sampling variability problems especially with occupations which are sparsely populated.

It should also be noted that the "earnings" variables group pertains to income year 1959. Thus, for occupationally mobile individuals, the earnings figure will not conform with their current occupational classifications. Furthermore, because of the "experienced civilian labor force" or "currently employed" base of the variables, individuals who worked in 1959 or early 1960 but who were "not-in-labor force" at Census taking time are not included in the tabulations. A qualification on the "unemployment rate" variable is also necessary. This is because the unemployed individual's job horizon will generally encompass options other than his most recent line of work. Thus, to speak of an unemployment rate for "welders" is a more tenuous concept than that of the "male" unemployment rate since it is more difficult for an individual to escape the classification of "male."

V. THE COMPONENT ANALYSIS MODEL

The "principal component analysis" model is a type of factor analytic technique. As such, this model has in common with other factor analytic techniques the general goal of producing a more parsimonious description of a data matrix, i.e., disentangling the patterns of interrelationship between variables in the attribute space into primary independent lines or dimensions of variation. These basis dimensions, which are a concise embodiment of the systematic variation in the original data matrix, outline the basic structure of a domain and, thus, produce the desired parsimonious description of the data. Furthermore, objects or cases can be "scaled" along each of the basis dimensions of the attribute space enabling a clustering of cases into groups based on similarity of profile values. It is seen, then, that factor analytic techniques serve as a tool for development of an empirical typology.

Unlike other factor analytic techniques in which it is assumed that each variable can be decomposed into "common" and "unique" parts, component analysis is concerned with the space defining the total variance of the variables in question. Component analysis produces the basis dimensions of the data making no assumption regarding the existence of common factors. In fact, since the component model analyzes total variation, the common, specific and random error variances are all intertwined in the basis dimensions. When the communality of the variables is high (as measured by the squared multiple correlation coefficient of each variable with all other variables), however, the results of component analysis will be quite

similar with those of common factor analysis [10, p. 112]. Component analysis has the additional advantage that an exact solution for the "scaling" of cases can be computed whereas only approximations are possible with the common factor analysis method [10, p. 436].

Mathematically, the "component analysis" model can be stated as follows:

$$
\begin{aligned}
Z_1 &= \alpha_{11}S_1 + \alpha_{12}S_2 + \ldots + \alpha_{1k}S_k + \ldots + \alpha_{1p}S_p, \\
Z_2 &= \alpha_{21}S_1 + \alpha_{22}S_2 + \ldots + \alpha_{2k}S_k + \ldots + \alpha_{2p}S_p, \\
&\vdots \quad\quad \vdots \quad\quad\quad \vdots \quad\quad\quad\quad \vdots \\
Z_j &= \alpha_{j1}S_1 + \alpha_{j2}S_2 + \ldots + \alpha_{jk}S_k + \ldots + \alpha_{jp}S_p, \\
&\vdots \quad\quad \vdots \quad\quad\quad \vdots \quad\quad\quad\quad \vdots \\
Z_m &= \alpha_{m1}S_1 + \alpha_{m1}S_1 + \ldots + \alpha_{mk}S_k + \ldots + \alpha_{mp}S_p,
\end{aligned}
$$

where: Z_j is the j-th standarized variable data vector; S_k is the k-th factor dimension; α_{jk} is the "loading" weight of factor dimension "k" on variable "j"; "m" is the number of variables; and, "p" is the dimensionality of the data. Stated in matrix form:

$$Z = SF' , \qquad (1)$$

where "Z" is an "n by m" matrix with rows of cases and columns of variables, "S" is an "n by p" matrix of "factor scores" or "scale values" of each case on each factor dimension of the data and "F" is a matrix size "m by p" of factor loadings.

From the above it should be apparent that there is a relationship between multiple linear regression and component factor analysis. The factor dimensions of "component analysis" are analogous to the independent

variables of "multiple regression analysis" and the loadings of the former are the regression coefficients of the latter [10, p. 204]. Yet, despite this relationship, the questions asked of the data are different. "Regression analysis" measures dependence of one variable on a set of other variables. In factor analytic techniques, the basic research question is one of interdependency, i.e., interest is in the smallest number of independent dimensions that will span the vector space defined by the original set of variables.

The objective of "component analysis" is to determine the elements of the factor loadings matrix (F) and the factor score matrix (S). Generally, the above is accomplished through "factoring" of the correlation matrix (R). The dependence of the solution on the correlation matrix is seen in the matrix manipulations below. From equation (1),

$$Z'Z = (SF')'(SF') = FS'SF'. \tag{2}$$

The inner product (S'S) of the right most expression reduces to (nI), where "n" is the number of cases and "I" is an "m by m" identity matrix, when the factor scores are orthogonal (uncorrelated) and column standardized. Thus, multiplying through by the scaler "1/n", one obtains:

$$(1/n)Z'Z = FF'. \tag{3}$$

The left side of equation (3) is the familiar matrix expression of the product moment correlation matrix; therefore,

$$R = FF' \tag{4}$$

or

$$r_{jk} = \sum_i \alpha_{ji}\alpha_{ik}. \tag{4'}$$

Equation (4) is known as the fundamental theorem of "factor analysis." The solution for "F" involves determination of the characteristic roots and vectors of "R" and is commonly known as the "principal axes" technique. Defining "E" as a matrix of eigenvectors and "λ" as a diagonal matrix of corresponding eigenvalues,

$$R = E\lambda E' = (E\lambda^{1/2})(\lambda^{1/2}E') = FF'. \qquad (5)$$

Thus, the matrix of factor loadings (F) is equal to the eigenvector matrix of "R" with each column eigenvector of "E" rescaled by the square root of its corresponding eigenvalue. The solution is mathematically unique. The columns of "F" are generally extracted in a "principal axes" algorithm such that the first factor explains the largest percent of variance, the second factor explains the largest percent of the remaining variance given that it is orthogonal to the first factor and so on. Each additionally extracted factor is orthogonal to those previously extracted. Generally, the number of possible factors is equal to the number of variables since, in most empirical investigations, the rank of the correlation matrix is equal to the number of variables. But, typically only a small number of these dimensions will be of interest in terms of their importance in accounting for variance in the original variable space.

For the "principal component" model, the solution for the matrix of factor scores (S) is straightforward. Employing equation (1) under the assumption that only "p" non-trivial factors were extracted from the data:

$$ZF = SF'F \qquad (6)$$

and thus,

$$S = ZF(F'F)^{-1}. \qquad (7)$$

If "F" is unrotated, "F'F" will be a matrix with the eigenvalues along its main diagonal [10, p. 436]. The "s_{ik}" element of "S" is the "score" or "scale value" of object "i" on dimension "k".

VI. EMPIRICAL RESULTS

A. The Unrotated Factor Matrix.

The "principal axes" method of factor analysis was applied to the product moment correlation matrix (R) of the variable set. Table I. presents the mathematically unique unrotated factor "loadings" matrix (F) for the first nine factors. The (i,j) loadings of "F" is the product moment correlation of variable "i" with factor dimension "j"; consequently, approximately 17 percent of the variance of "percent male" is explained by the first factor. In factor analysis there is a general problem of when to stop extracting factors.[1] The "eigenvalue-one" criterion was employed in this investigation, i.e., only those factors with eigenvalues greater than unity were extracted [10, p. 362]. The first nine factors account of 83 percent of the variance in the transformed data matrix. Or, stated alternatively, the remaining possible 45 factors explain only 17 percent of the variance. The column vector "h_j^2" has as its elements the sum of squared factor loadings across factors and is known as the "communality" of a variable. This measures

---

[1] A number of criteria have been developed for the "number of factors" problem. For a discussion of these the reader is referred to Chapter 15 of Rummel [10]. In recent years the "eigenvalue-one" criterion has been widely employed.

TABLE I. UNROTATED FACTOR MATRIX

	1	2	3	4	5	6	7	8	9	h_j^2
PERCENT MALE	-0.410	-0.619	-0.182	-0.473	0.123	0.005	-0.058	-0.104	0.187	0.873
" WHITE MALE	-0.671	-0.411	-0.068	-0.408	0.169	-0.005	-0.041	0.063	0.063	0.828
" WHITE FEMALE	0.349	0.608	0.250	0.508	-0.141	0.031	-0.010	0.153	-0.155	0.881
" MARRIED	-0.613	-0.349	-0.454	-0.082	-0.115	-0.110	0.082	0.056	-0.076	0.751
" MARRIED MALE	-0.786	-0.199	-0.405	0.048	-0.151	0.034	0.007	0.116	-0.051	0.863
UNEMPLOYMENT RATE--TOTAL	0.738	-0.506	-0.058	-0.217	-0.003	0.038	-0.120	0.046	-0.256	0.935
" " --MALE	0.716	-0.484	-0.069	-0.273	0.019	0.033	-0.136	-0.013	-0.217	0.892
" " --FEMALE	0.448	-0.403	-0.012	-0.104	-0.034	0.112	0.011	0.081	-0.449	0.596
" " --WHITE	0.722	-0.514	-0.048	-0.216	-0.011	0.040	-0.143	0.062	-0.238	0.917
" " --NON-WHITE	0.596	-0.414	-0.057	-0.266	-0.024	0.108	0.019	0.048	-0.231	0.668
NOT-IN-LABOR FORCE RATIO--MALE	0.784	0.117	-0.106	-0.204	0.285	-0.035	-0.226	-0.168	-0.075	0.848
" " " " " --FEMALE	0.458	0.128	0.100	-0.199	0.223	0.068	-0.230	-0.114	-0.299	0.485
" " " " " --TOTAL	0.828	0.293	-0.004	-0.006	0.115	-0.018	-0.230	-0.071	-0.160	0.869
EARNINGS ($000)-- 0-2	0.842	0.411	-0.118	-0.063	0.045	0.088	0.067	-0.019	0.032	0.912
" " -- 2-3	0.690	-0.037	-0.061	0.259	-0.186	0.492	0.093	0.043	-0.040	0.836
" " -- 3-4	0.351	-0.325	0.053	0.448	-0.178	0.617	-0.088	-0.052	0.071	0.860
" " -- 4-5	-0.109	-0.620	0.041	0.346	-0.041	0.353	-0.341	-0.240	0.209	0.862
" " -- 5-6	-0.496	-0.595	0.060	0.122	0.054	0.081	-0.427	-0.102	0.177	0.852
" " -- 6-7	-0.728	-0.413	0.143	-0.061	-0.001	-0.070	-0.345	0.062	0.073	0.858
" " -- 7-8	-0.820	-0.229	0.131	-0.221	-0.078	-0.098	-0.264	0.130	-0.030	0.893
" " -- 8-10	-0.840	-0.030	0.130	-0.297	-0.121	-0.067	-0.189	0.147	-0.060	0.892
" " -- 10-15	-0.796	0.181	0.137	-0.343	-0.129	0.042	-0.122	0.106	-0.087	0.854
" " -- 15+	-0.685	0.320	0.007	-0.373	-0.205	0.199	-0.039	0.150	-0.069	0.821
YEARS OF EDUCATION-- 5-7	0.537	-0.502	-0.504	-0.007	0.107	0.078	0.216	-0.012	-0.104	0.870
" " " -- 8	0.392	-0.459	-0.587	0.061	0.153	-0.054	-0.036	0.183	0.034	0.774
" " " -- 9-11	0.496	-0.402	-0.090	-0.003	0.421	-0.093	-0.068	0.441	0.115	0.813
" " " -- 12	-0.139	-0.077	0.356	0.416	0.294	0.060	-0.429	0.458	0.017	0.809
" " " -- 13-15	-0.482	0.503	0.412	0.027	0.089	0.011	-0.404	0.080	-0.027	0.834
" " " -- 16	-0.586	0.549	0.299	-0.123	-0.074	0.013	-0.233	-0.143	-0.120	0.844
" " " -- 17+	-0.529	0.621	0.298	-0.099	-0.136	0.066	-0.122	-0.178	-0.083	0.840
WEEKS WORKED PREVIOUS YEAR-- 1-13	0.896	0.232	0.038	-0.110	0.045	-0.020	-0.114	-0.066	-0.033	0.890
" " " " -- 14-26	0.905	0.109	0.064	-0.227	-0.098	-0.044	-0.106	-0.058	-0.033	0.913
" " " " -- 27-39	0.709	-0.182	-0.115	-0.258	-0.386	-0.036	-0.215	-0.047	0.192	0.851
" " " " -- 40-49	0.525	-0.297	-0.199	-0.237	-0.546	0.079	-0.068	0.051	0.297	0.860
" " " " -- 50-52	-0.843	0.002	0.085	0.261	0.280	0.111	0.104	0.017	-0.182	0.920
HOURS-- 1-14	0.656	0.522	-0.074	-0.274	0.007	0.040	-0.151	-0.010	0.104	0.818
" -- 15-29	0.723	0.400	-0.101	-0.253	-0.161	0.004	-0.127	0.154	0.160	0.847
" -- 30-34	0.654	0.062	-0.244	-0.142	-0.509	0.003	0.018	0.180	0.143	0.822
" -- 35-39	0.172	0.363	0.266	0.075	-0.490	0.018	-0.121	0.420	-0.158	0.694
" -- 40	-0.024	-0.679	0.238	0.399	-0.112	-0.197	-0.178	-0.213	-0.160	0.831
" -- 41-48	-0.582	0.045	-0.120	-0.053	0.099	0.527	0.206	0.209	-0.071	0.736
" -- 49-59	-0.603	0.142	-0.178	-0.372	0.262	0.503	0.055	0.103	0.089	0.898
" -- 60+	-0.485	0.337	-0.318	-0.397	0.276	0.355	0.003	-0.078	0.073	0.821
AGE OF EMPLOYED-- 14-17	0.770	0.149	0.214	-0.177	0.286	0.068	0.028	0.113	0.077	0.797
" " " -- 18-19	0.800	-0.032	0.409	0.025	0.217	0.081	-0.006	0.111	0.099	0.885
" " " -- 20-24	0.576	-0.138	0.691	0.089	0.028	0.200	-0.055	-0.024	0.095	0.890
" " " -- 25-29	-0.042	-0.273	0.789	-0.161	-0.166	0.236	0.041	-0.200	-0.054	0.852
" " " -- 30-34	-0.462	-0.334	0.558	-0.202	-0.240	0.151	0.122	-0.132	-0.168	0.818
" " " -- 35-44	-0.650	-0.357	0.083	-0.038	-0.228	-0.061	0.136	0.088	-0.225	0.690
" " " -- 45-54	-0.319	-0.084	-0.721	0.272	-0.188	0.063	-0.064	0.099	-0.080	0.753
" " " -- 55-59	-0.210	0.080	-0.851	0.217	-0.099	0.016	-0.183	-0.070	-0.072	0.874
" " " -- 60-64	-0.190	0.165	-0.845	0.192	-0.024	0.005	-0.246	-0.097	-0.068	0.889
" " " -- 65-69	-0.067	0.449	-0.745	0.061	0.031	0.073	-0.236	-0.110	-0.092	0.847
" " " -- 70-74	-0.048	0.563	-0.629	-0.051	-0.001	0.148	-0.140	-0.103	-0.120	0.784
EIGEN VALUES	19.37	7.50	6.64	3.14	2.27	1.78	1.68	1.25	1.20	
PERCENT VARIANCE	35.88	13.88	12.30	5.82	4.21	3.30	3.12	2.32	2.22	83.048

the proportion of variance of each variable involved in the nine dimensional factor space. Also posted in Table 1 are eigenvalues for the first nine factors along with percent variance which is equal to λ_i/m. The eigenvalue for any given factor is equivalent to the sum of the squared loadings for the factor dimension.

From the relative size of the first eigenvalue it is apparent why the first factor dimension is often regarded as the general factor. More than one-third of the variation is dependent on this dimension. Moreover, the pattern of factor weights of this first dimension are readily interpretable in a labor market sense. Percent white female, the unemployment rates, the NLFR variables, low earnings, education, weeks worked, hours and age all possess appreciably positive loadings. Strongly negative weights are found on the male, white male, married and married male variates as with high earnings, education, full-year weeks worked, long hours and middle age. If a name were to be attached to this dimension, a "prime-aged male" label would seem appropriate. Occupations dominated by women, blacks and young workers of a general part-time:part-year nature with low education requirements and meager compensation would score high on this factor while those occupations inhabited by prime-aged males would score low.

The second dimension of the unrotated factor matrix indicates another male dominated dimension while factor three is weighted heavily on older worker age categories. Beyond these three factors, loading patterns are less interpretable. Techniques of matrix

rotation to "simple structure" have been developed to facilitate interpretation of dimensions. Rotation is performed to discern the cluster patterning of variables as is seen by the example in Figure I. In this example it is seen that the variables load highly on both dimensions as evidenced by their respective projections onto the unrotated axes. For the orthogonally rotated axes, the cluster patterning of the variables is more readily discernable. It is apparent from this example that "oblique" rotation even better identifies the cluster patterning of the factor space. In fact, it is the general solution for rotation whereas "orthogonal" rotation is a subset of "oblique" rotation. Unlike "orthogonal" rotation, "oblique" rotation permits intercorrelations of basis dimensions. The question of which technique to employ was empirically determined in this investigation. On the basis of a number of significant intercorrelations of obliquely determined dimensions, it was decided not to impose orthogonality through use of such a rotation model. Complexity of the factor space necessitated an "oblique" rotation.

B. Oblique Rotated Factor Matrix.

Table II. presents the results of an oblique "binormamin" rotation of the unrotated matrix of Table I.[1] There are two matrices generated by oblique rotation: the "factor pattern" and the "factor structure" matrix. The first, which is presented in Table II , is best for discernment of the clustering of variables on factor dimensions.

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[1]There are a number of methods for oblique rotation [7, ch. 15] [10, sect. 17.3]. The "binormamin" method is useful when the factor space is relatively simple or highly complex. On the basis of the complexity of the space, the "binormamin" method was selected.

FIGURE I.

Illustration of the Objective of Rotation

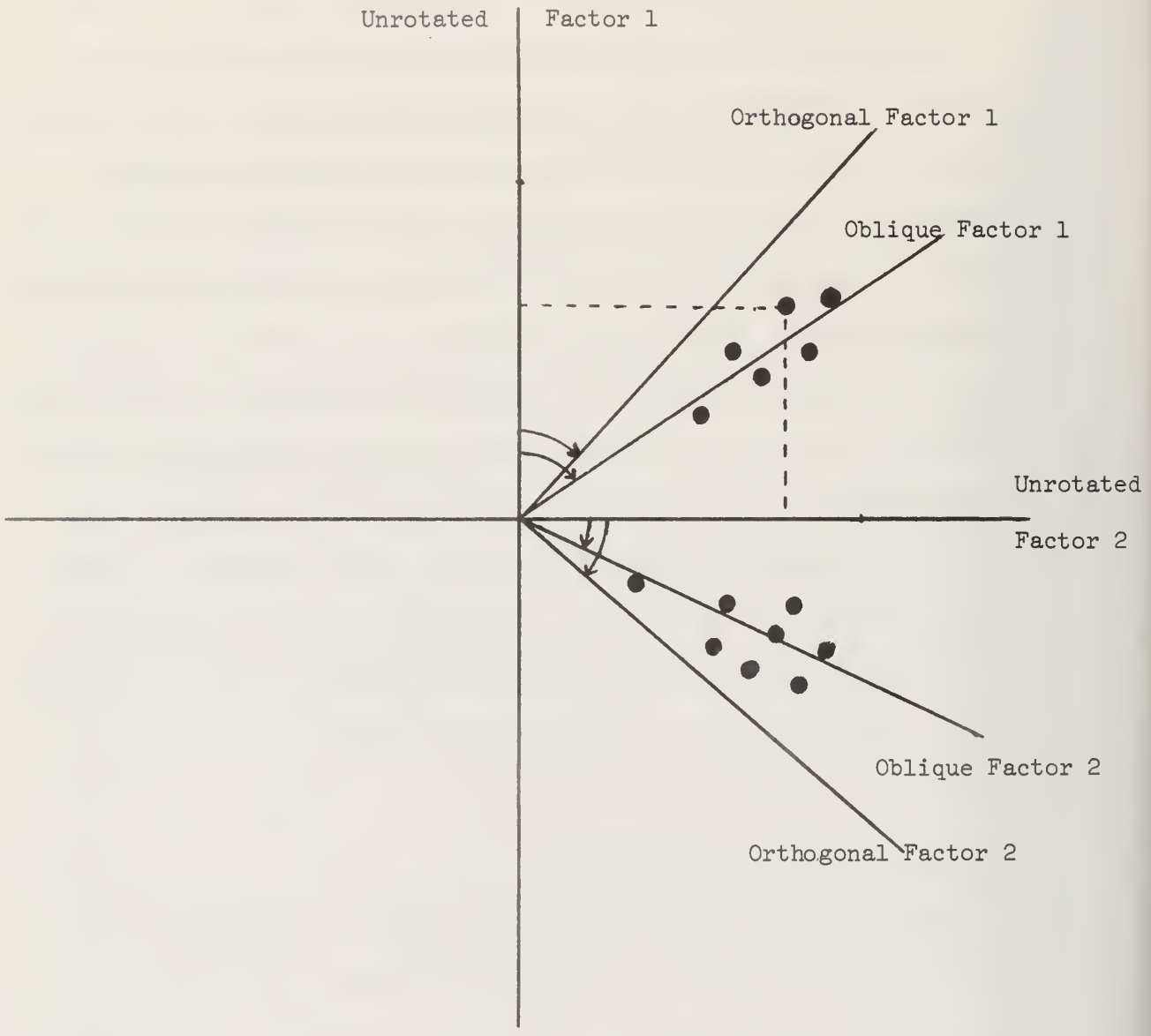

TABLE II. PRIMARY FACTOR PATTERN MATRIX[a]

	1	2	3	4	5	6	7	8	9
PERCENT MALE	0.932**	-0.129	-0.215	-0.115	0.145	0.064	0.240	0.009	-0.102
" WHITE MALE	0.845**	-0.271*	-0.092	-0.113	-0.011	0.090	0.302*	-0.151	0.054
" WHITE FEMALE	-0.887**	0.116	0.281*	0.097	-0.095	-0.096	-0.223	0.050	0.195
" MARRIED	0.524**	-0.626**	-0.231	0.321*	-0.021	0.070	0.017	-0.166	-0.088
" MARRIED MALE	0.436*	-0.655**	-0.058	0.387*	-0.015	-0.028	0.119	-0.020	0.024
UNEMPLOYMENT RATE--TOTAL	0.173	0.185	-0.276*	-0.007	0.166	0.669**	-0.085	0.026	0.031
" " --MALE	0.220	0.251*	-0.236	-0.010	0.179	0.637**	-0.065	0.032	-0.012
" " --FEMALE	0.029	-0.077	-0.186	0.025	-0.091	0.744**	-0.036	-0.015	-0.012
" " --WHITE	0.201	0.181	-0.263*	-0.009	0.197	0.654**	-0.082	0.036	0.060
" " --NON-WHITE	0.127	0.104	-0.271*	-0.086	0.134	0.582**	0.058	0.004	-0.060
NOT-IN-LABOR FORCE RATIO--MALE	-0.152	0.756**	-0.024	0.132	0.018	0.327*	-0.038	-0.016	-0.009
" " " " --FEMALE	-0.088	0.540**	0.238	0.080	-0.143	0.528**	0.024	-0.025	0.028
" " " " --TOTAL	-0.416*	0.657**	0.126	0.181	0.055	0.315*	-0.144	0.008	0.068
EARNINGS ($000)-- 0-2	-0.586**	0.569**	-0.099	0.028	0.171	0.034	0.099	0.002	-0.086
" " -- 2-3	-0.589**	0.139	-0.137	0.017	0.151	0.146	0.186	0.537**	-0.046
" " -- 3-4	-0.343*	0.025	-0.080	0.019	0.090	0.031	0.146	0.805**	0.045
" " -- 4-5	0.285*	-0.001	0.025	0.092	0.044	-0.076	-0.066	0.846**	0.076
" " -- 5-6	0.698**	-0.132	0.115	0.098	0.047	-0.053	-0.089	0.438*	0.233
" " -- 6-7	0.805**	-0.301*	0.243	0.019	0.078	-0.005	-0.049	0.065	0.277*
" " -- 7-8	0.810**	-0.373*	0.360*	0.019	0.120	0.077	0.042	-0.144	0.223
" " -- 8-10	0.711**	-0.355*	0.454*	0.006	0.143	0.067	0.140	-0.225	0.161
" " -- 10-15	0.536**	-0.249	0.558**	-0.008	0.121	0.065	0.273*	-0.202	0.069
" " -- 15+	0.376*	-0.225	0.524**	0.047	0.230	0.050	0.459*	-0.136	0.011
YEARS OF EDUCATION-- 5-7	-0.062	-0.080	-0.774**	0.169	-0.089	0.322*	0.040	0.069	-0.173
" " " -- 8	0.140	-0.084	-0.747**	0.353*	0.093	0.168	-0.012	-0.005	0.167
" " " -- 9-11	0.119	0.128	-0.756**	-0.132	0.042	0.107	0.096	-0.168	0.525**
" " " -- 12	0.025	0.014	0.043	-0.005	-0.117	-0.021	-0.018	0.137	0.832**
" " " -- 13-15	0.085	0.226	0.777**	0.035	-0.035	-0.090	0.052	-0.028	0.366*
" " " -- 16	0.099	0.128	0.885**	0.075	-0.066	-0.023	0.049	-0.068	-0.013
" " " -- 17+	-0.050	0.122	0.863**	0.020	-0.051	-0.107	0.085	-0.023	-0.118
WEEKS WORKED PREVIOUS YEAR-- 1-13	-0.372*	0.641**	0.030	-0.010	0.203	0.200	-0.091	-0.006	-0.015
" " " " -- 14-26	-0.205	0.556**	0.057	-0.076	0.373*	0.261*	-0.117	-0.032	-0.068
" " " " -- 27-39	0.206	0.310*	0.037	0.029	0.798**	0.086	-0.149	0.147	-0.071
" " " " -- 40-49	0.274*	0.013	-0.101	-0.027	0.935**	-0.060	-0.007	0.231	-0.108
" " " " -- 50-52	0.010	-0.412*	0.044	0.046	-0.692**	-0.037	0.146	0.012	0.081
HOURS-- 1-14	-0.270*	0.691**	0.213	0.070	0.399*	0.012	0.156	-0.063	0.006
" -- 15-29	-0.205	0.509**	0.089	0.040	0.635**	-0.025	0.114	-0.093	0.095
" -- 30-34	-0.105	0.037	-0.097	0.089	0.906**	-0.016	-0.032	0.001	-0.046
" -- 35-39	-0.230	-0.167	0.430*	0.006	0.503**	0.118	-0.075	-0.130	0.313*
" -- 40	0.194	-0.291*	-0.025	0.009	-0.235	0.199	-0.665**	0.256*	0.002
" -- 41-48	0.034	-0.341*	-0.065	-0.014	-0.212	0.040	0.711**	0.182	0.047
" -- 49-59	0.322*	0.012	0.060	-0.021	-0.074	-0.017	0.879**	0.128	0.030
" -- 60+	0.226	0.211	0.164	0.171	-0.097	-0.034	0.721**	0.042	-0.113
AGE OF EMPLOYED-- 14-17	-0.318*	0.607**	-0.203	-0.351*	0.072	0.086	0.183	-0.067	0.138
" " " -- 18-19	-0.363*	0.518**	-0.202	-0.467*	0.052	0.044	0.018	0.101	0.204
" " " -- 20-24	-0.268*	0.409*	0.114	-0.620**	0.071	0.022	-0.045	0.348*	0.116
" " " -- 25-29	0.154	0.055	0.442*	-0.710**	-0.004	0.161	0.024	0.297*	-0.182
" " " -- 30-34	0.372*	-0.341*	0.388*	-0.511**	-0.077	0.218	0.042	0.107	-0.227
" " " -- 35-44	0.421*	-0.706**	0.052	-0.066	-0.115	0.186	-0.066	-0.149	-0.066
" " " -- 45-54	0.066	-0.483*	-0.215	0.750**	0.052	0.016	-0.003	0.117	0.036
" " " -- 55-59	0.030	-0.201	-0.096	0.936**	0.030	0.029	-0.047	0.123	-0.044
" " " -- 60-64	0.020	-0.072	-0.032	0.968**	0.002	0.031	-0.033	0.109	-0.016
" " " -- 65-69	-0.134	0.178	0.141	0.887**	0.010	0.060	0.110	0.052	-0.044
" " " -- 70-74	-0.205	0.216	0.230	0.734**	0.025	0.085	0.235	0.014	-0.117
Sums of Squares	8.228	7.084	6.349	5.803	4.177	3.205	3.131	2.772	1.812

[a] A double asterisk signifies loadings greater in absolute value of .50, while a single asterisk is used for values greater than .25 but less than .50.

TABLE III.

INTERCORRELATIONS OF PRIMARY FACTORS

	1	2	3	4	5	6	7	8	9
1	1.00								
2	- .03	1.00							
3	- .04	- .37	1.00						
4	.06	.02	- .05	1.00					
5	- .47	.14	- .31	- .06	1.00				
6	- .27	.15	- .35	- .32	.44	1.00			
7	- .01	- .18	.29	.29	- .15	- .25	1.00		
8	.14	- .13	- .23	- .21	- .03	.23	- .31	1.00	
9	- .09	- .08	.14	- .18	- .18	- .01	- .12	.13	1.00

Loadings on the "primary factor pattern" matrix measure the "unique" contribution of a particular factor dimension to the variance of a given variable; thus, these weights are analogous to regression coefficients of the variables on the factors. The "primary factor structure," which has as its element the product moment correlations between variables and factors, is presented in Appendix A. Corresponding values on the two matrices are not identical due to intercorrelations of the factor dimensions. Sums of squares by factor dimensions of the "primary factor pattern" matrix indicate the relative importance of a given dimension in the factor space. As can be seen by comparison of these values with those corresponding to the unrotated factor matrix, one effect of "oblique rotation" is to more evenly spread the variance across factor dimensions. Presented in Table III are the intercorrelations of the factor pattern dimensions. These coefficients are equivalent to product moment correlations between the column vectors of the factor score matrix (S).

C. Interpretation of Factor Dimensions.

Each of the factor dimensions will be briefly discussed in this section. A label is given to each dimension which will, hopefully, summarize the content of each respective dimension. The intercorrelations of the factor pattern dimensions will also be examined.

Factor 1: Male-Remunerative Dimension. This dimension is almost totally dominated by sex, sex-race variables and earnings variables. Strong positive weights are found on percent male, percent white male and the upper earnings categories. The percent white female variable is extremely negative. Marital status variables are intermediately

positive. NLFR-total is intermediately negative. Earnings variables begin negative in the lower range and are extremely positive in the five to ten thousand dollar range. There is drop in the magnitude of the positive weight for the two highest earnings categories. Few of the variables in the unemployment, education, weeks worked, hours and age variable sets are of importance although the pattern of the loadings on the age variable set is quite interesting. Negative weights are recorded on young and older worker categories and intermediately positive weights are registered on two middle age categories of 30-34 and 35-44 years.

That there is a male dimension to the employment structure is no surprise. But, coupled with the pattern of the earnings variables along with very close to nil loadings on the education variable set, the importance of this dimension is greatly amplified. Alternative labels for this dimension might be "returns to male" and "unjustified success." Taking into account the age and marital status loadings, a less controversial label would be "head of household" dimension. One must apply caution in use of the more controversial labels, including the one chosen for this dimension, since "on-the-job training," experience, skill attributes, working conditions, etc. were not included in the variable set. Additional modelling and testing is called for along lines of this apparent dimension of occupations.

Factor 2: Youth-Marginal Dimension. Examination of the loadings on this first dimension indicates a segmentation of the occupation-attribute space by marital status, strong NLFR's, very low earnings, hours, weeks worked and age. Percentage white male has a negative

effect on this dimension as is also the case with the higher earnings categories, full-year weeks worked, 40-48 hours and middle age. Particularly important is the negative effect of the 35-44 years of age category. The unemployment and educational categories have, notably, little bearing on this dimension. This general lack of significance of unemployment coupled with the strong impact of the NLFR categories underscores the importance of interaction between not-in-labor force status and occupational supply. Probably, this interaction is not coupled with long periods of intervening unemployment. Lack of significance of education categories is, indeed, puzzling. It will be seen that this dimension correlates negatively with Factor 3, a dimension dominated by the educational variables. This affords a partial explanation for the poor showing of the education variables on this "youth-marginal" dimension.

This dimension is, notably, not correlated with Factor 1. Thus, these first two dimensions are essentially orthogonal segmentations of the labor market.

Factor 3: Human Capital Dimension. The most striking feature of this third dimension is the pattern and magnitudes of the education variables. These weights are substantially negative for the first three educational variates with twelve years of education serving as the "twist" variable in this education variable set with its low positive weight serving as a divider. Strong positive weights are registered on all higher education categories. Intermediately positive are the variables percent white female, the upper earnings categories beginning with seven thousand plus dollars, the 34-39 hours variable

and two age categories: 25-29 and 30-34 years. Low to intermediately negative are the unemployment rate variables. Dominance for this dimension is, of course, furnished by the educational variable set and secondly by upper earnings. There are those who may disagree with the labelling since "on-the-job training" and other types of formalized vocational learning are not included in the variable set. Yet, it is believed that the "human capital" label captures the dominant substance of this dimension. An alternative label might be "returns to general education."

Theoretically, one would expect more bearing on this dimension of low earnings, weeks worked, hours and age than was found. This is partially accounted for by significant negative correlation of the "human capital" dimension with the "youth-marginal" dimension (-.37). Yet, this implies in the prediction of one factor score set from the other an explained variance of less than fourteen percent that, while significant, is still relatively low. This relationship with the "youth-marginal" dimension is the theoretically postulated result, however.

With respect to the first dimension, "human capital" is essentially orthogonal.

Factor 4: Senior Worker Dimension. This dimension is relatively straightforward in interpretation as is seen by the extremely high loadings on all age variables of 45+ years. All other age variables are negative in sign with the two twenty year old categories possessing the larger magnitudes. The 35-44 years of age variable is the "twist variable" in this age segmentation of occupations. None of the other

variables weight heavily on this dimension although intermediately positive loadings are registered on the marital status variables and the eight years of education variable. Otherwise, this dimension is null with respect to sex, sex-race, unemployment, NLFR, earnings, education, weeks worked and hours. Occupations will score on this dimension almost solely on the basis of their respective age distribution skew and variance patterns.

It is interesting to note that the pattern of age variable loadings is not symmetric in that the two lowest age categories, while negative, are not of appreciable magnitude. This is explained, in part, by occupations possessing relatively flat, if not bimodal, age distributions such as the "private household" occupational categories.

The significance of this dimension for manpower and labor market research is multifold. This is particularly true for "occupational mobility" research since occupations dominated by older workers would tend to be of longer tenure. That is to say, younger workers account for the lion's share of occupational mobility. Furthermore, if this dimension is relatively constant through time, due to attrition only, certain patterns of occupational mobility are dictated.

One is tempted to theorize as to reasons for existence of such a dimension. For declining occupations, it might be hypothesized that younger workers would have a greater propensities for retraining and relocation due to the longer time perspective they have to reap the benefits from such. Their attachment would, then, likely be less for

a given declining occupational category. Furthermore, the attraction of younger workers to a declining occupation would, undoubtedly be less. Younger workers would also tend to place low on the rungs of the seniority ladder with obvious consequences. As a result, the age distribution would become increasingly negatively skewed for such occupations with passage of time. "Senority grading" of certain occupations would be an alternative hypothesis. To be a "locomotive engineer" a younger worker must, in many instances, pass through a training period as a "locomotive fireman." The natural expectation would be for differentials in the skew patterns of the age distribution for these two occupations. One would expect similar relationships for "apprenticeship" occupations relative to their respective "journeyman" occupational counterparts. Another possible hypothesis postulates the existence of job categories, with relatively light physical requirements, which are particularly suited to habitation by older workers. "Watchmen" and "janitors" would be possible examples. It is likely that no single theoretical structure can fully account for the complexity of this dimension of occupations. Rather, it is probable that an intermingling of structural relationships operates to produce this apparent labor market segmentation.

The "senior worker" dimension is essentially orthogonal to the three previous dimensions. Thus, it is quite possible for a given occupation to score high or low on all four dimensions.

Factor 5: Seasonality Dimension. This particular dimension is not readily interpretable. The strong positive loadings on 27-39 and 40-49 weeks worked coupled with the negative magnitude of full-year weeks worked and weaker positive magnitudes for the two lower weeks

worked categories suggests that occupations scoring high on this dimension will not necessarily be "marginal" types. This is also suggested by the loadings on the hours variable set. Lack of strong correlation with the "youth-marginal" dimension adds credence to this hypothesis. To be truthful, factor scores on this dimension were examined to get a better feel for what this dimension was picking up. It was found that occupations with a general "seasonal" flavoring scored highly on this dimension such as "teachers" and several construction related jobs such a "brickmasons" and "carpenters." Thus, the "seasonality" label was employed although it is not believed that this label fully captures the content of this dimension.

This dimension correlates negatively with the "male-remunerative" dimension (-.47) and the "human capital" dimension (-.31) and is essentially orthogonal with the "senior worker" and "youth-marginal" dimensions.

Factor 6: Labor Reserve Dimension. Unemployment and NLFR, especially with respect to "female," are the important determinates of this dimension with minor ties to low education, low weeks worked and the 25-29 and 30-34 years of age variables. It is somewhat surprising to find this dimension so far down the line. In slight compensation, there are significant relations to previously extracted dimensions with the a priori expected signs on the correlation coefficients. A low, though significant positive correlation is registered with the "youth-marginal" dimension (.15). It is remembered that on the first dimension the NLFR variables registered their highest loadings.

This result seems to further underscore the relative importance of NLFR versus unemployment rates as significant labor market variables of occupations.

Factor 7: Long Hours Dimension. The largest positive loadings on this dimension are registered on the three variables of 41+ hours with a substantially negative loading on the 40 hours variable. Percent white male and the two highest earnings categories play a minor role in this dimension. It has long been recognized that some occupations have appreciably longer work weeks, particularly the higher status occupations such as "lawyers and judges" and "physicians and surgeons."

Low negative correlations are registered with the second and fifth dimensions, -.18 and -.15, respectively. Positive correlations of +.29 were found with the "human capital" and "senior worker" dimensions. Notably, this dimension is orthogonal to male-remunerative.

Factor 8: Mid-Remunerative Dimension. Except for the lowest category, loadings on this dimension concentrate on the first five earnings variables, particularly the three to four and four to five thousand dollar categories. Minor positive weight is recorded on the 40 hours variable. Intermediately positive loadings are registered on the two twenty years of age variables which, in conjunction with the weights on the earnings variables, suggests a possible "career-step" orientation to occupations scoring highly on this dimension. This dimension is negatively related to the previous seven dimensions except for "male-remunerative" and "labor reserve." It is also essentially orthogonal to the "seasonality" dimension.

Factor 9: Mid-Educative Dimension. The feature of this dimension is the patterning of the education variables around "completed high school education." There are minor ties to the structure of compensation as witnessed by the three earnings variables in the five to eight thousand dollar ranges. Examination of intercorrelations reveals, generally, minor association with the other dimensions. Such jobs would likely be characterized by intermediate educational standards. Returns to higher education would tend to diminish rapidly, however. As indicated by the lack of correlation with the second and sixth dimensions and the negative correlation with the "seasonality" dimension, these jobs offer a reasonable degree of steadiness of employment. In exchange, it is hypothesized that employers impose intermediate educational requirements as minimal prerequisities of employment.

The interpretation of the factor dimensions is, of course, purely subjective. Although it is believed that the labels which were utilized capture much of the content of the dimensions, there is no claim that the labels are exhaustive. Other alternative nomens are possible and, indeed, for some of the dimensions additional titles have been suggested. To assist the reader who is interested in a more thorough examination of the content of each dimension, the factor score matrix "S" is included in Appendix B along with the respective detailed occupational titles.

VII. SUMMARY AND CONCLUSIONS

In this study an attempt was made to delineate the principal structures of occupational labor market segmentation. The data base consisted of nine labor market variable sets on the detailed occupational categories and industrial divisions thereof for the 1960 Census of Population. A product moment correlation matrix between variables

was "factor analyzed" by the "principal component" method and was found to be essentially reproducible through employment of nine basis dimensions (83 percent explained variation). The factor matrix was rotated to "oblique simple structure" by the "binormamin" method to facilitate interpretation of the basis dimensions. Content of each of the rotated dimensions was examined and found to be generally interpretable in a labor market context. In order of importance, the basis dimensions were labelled as "male-remunerative, youth-marginal, human capital, senior worker, seasonality, labor reserve, long hours, mid-remunerative, and mid-educative."

The general picture which emerges from this investigation is one of extreme complexity of the labor market attribute space of occupations. Although a substantial reduction in the dimensionality of the original variable space was achieved while preserving much of the information in that space, the structure of the intercorrelations between factors suggest these dimensions are delineating essentially independent interrelationatory patterns. This is to say knowledge of the factor scores of occupations on a given dimension offers little and sometimes no information for prediction of factor scores on other dimensions. The labor market attribute space of occupations is <u>multidimensional</u>. It defies broad simplification and generalizations as to its structure.

Due to the multidimensional structure of the attribute space, any given occupation system will suppress relevant information. There is, in all probability, no single system which can satisfy all research needs. No single criterion for aggregation of the detailed classifications will suffice. A particular research endeavor may even require the

development and use of several systems. Thus, the dream of a single occupation system still retains its metaphysical character. "It is up to the analyst in a specific area then to try to redeploy the data for his uses." [9, p. 207]

Knowledge of the labor market dimensionality of occupations is certainly pertinent information which can be utilized in other investigations. Lack of generalizability of the entire structure does not pertain to its individual parts. Thus, one interested in "youth labor markets" may employ factor scores on the second dimension to construct an occupation system. Or, for example, occupations may be grouped on the basis of the "male-remunerative" dimension and each of these groups further divided by "labor reserve" factor scores. Generalized methods exist for computation of "distance measures" between occupation pairs and "clustering" of occupations on the basis of these distance measures employing any combination or all of the dimensions. Alternatively, one can use the dimensions as input to another conceptual system such as the "job family" approach.

Aside from the typological conveniences afforded by the "principal component" technique, additional implications for labor market and manpower research are seemingly apparent. Probably the most predominant of these implications is the very existence of meaningful occupational labor market segmentation. To the extent which it exists, labor market segmentation should be incorporated into research methodology rather than relegated to error terms. A pure example relates to the numerous attempts to measure "returns to education." Such attempts may have

residual variation as their most interesting aspects if the strength of the "male-remunerative" dimension can be accepted as being anywhere near to the truth. Without a methodological handle on "returns to maleness," it is not likely that "returns to education" can be systematically assessed. Through this example it is seen that knowledge of the labor market dimensionality of occupations can be useful information in the modelling of labor market and manpower research questions.

BIBLIOGRAPHY

1. L. Brown and J. Smith, "Bridging Occupations," British Journal of Sociology, December, 1963.

2. G. Cain, W. Hansen, and B. Weisbrod, "Classification of Occupations: Some Problems of Economic Interpretation," Social Statistics Section, Proceedings of the American Statistical Association, 1966.

3. J. E. Cairnes, Some Leading Principles of Political Economy, Newly Expounded. New York: Harper, 1874.

4. Alba M. Edwards, "Social Economic Groups of the United States," Journal of the American Statistical Association, June, 1917.

5. _____, Comparative Occupational Statistics for the United States, 1870 - 1940. Washington: Bureau of the Census, 1943.

6. Stanley Greene, "Some Recent Decennial Census Occupational Experimental Work," Social Statistics Section, Proceedings of the American Statistical Association, 1966.

7. H. H. Harman, Modern Factor Analysis. Second Edition, Revised. Chicago: The University of Chicago Press, 1967.

8. R. W. Hodge and P. M. Siegel, "The Classification of Occupations: Some Problems of Sociological Interpretation," Social Statistics Section, Proceedings of the American Statistical Assocation, 1966.

9. S. Lebergott, "Discussion," Social Statistics Section, Proceedings of the American Statistical Association, 1966.

10. R. J. Rummel, Applied Factor Analysis. Evanston: Northwestern University Press, 1970.

11. J. G. Scoville, The Job Content of the U. S. Economy, 1940-1970. McGraw-Hill, 1969.

12. _____, "The Development and Relevance of the U. S. Occupational Data," Industrial and Labor Relations Review, XIX:1 (October, 1965).

13. _____, "Making Occupational Statistics More Relevant," Business and Economic Statistics Section, Proceedings of the American Statistical Association, 1965.

14. _____, "Education and Training Requirements for Occupations," Review of Economics and Statistics, XLVIII:4 (November, 1966).

15. U. S. Bureau of the Census, U. S. Census of Population: 1960. Subject Reports. Occupational Characteristics. Final Report PC(2)-7A. U. S. Government Printing Office, Washington, D. C., 1963.

APPENDIX A. PRIMARY FACTOR STRUCTURE MATRIX

	1	2	3	4	5	6	7	8	9
PERCENT MALE	0.858	-0.084	-0.214	0.005	-0.232	-0.091	0.129	0.152	-0.239
" WHITE MALE	0.803	-0.295	0.095	0.021	-0.434	-0.242	0.309	-0.025	-0.047
" WHITE FEMALE	-0.832	0.030	0.284	-0.041	0.204	0.057	-0.126	-0.098	0.339
" MARRIED	0.543	-0.516	-0.025	0.386	-0.258	-0.238	0.202	-0.028	-0.200
" MARRIED MALE	0.487	-0.664	0.203	0.447	-0.355	-0.389	0.343	0.016	-0.058
UNEMPLOYMENT RATE--TOTAL	-0.081	0.413	-0.662	-0.242	0.495	0.847	-0.408	0.271	-0.062
" " --MALE	-0.030	0.460	-0.643	-0.222	0.473	0.802	-0.381	0.247	-0.111
" " --FEMALE	-0.121	0.097	-0.401	-0.206	0.273	0.748	-0.235	0.218	-0.031
" " --WHITE	-0.065	0.402	-0.650	-0.247	0.495	0.835	-0.409	0.291	-0.037
" " --NON-WHITE	-0.087	0.296	-0.548	-0.233	0.434	0.731	-0.227	0.193	-0.141
NOT-IN-LABOR FORCE RATIO--MALE	-0.261	0.931	-0.432	0.027	0.346	0.459	-0.222	-0.070	-0.085
" " " " " --FEMALE	-0.190	0.510	-0.086	-0.081	0.119	0.448	-0.090	-0.059	0.026
" " " " " --TOTAL	-0.542	0.699	-0.269	0.002	0.441	0.484	-0.270	-0.076	0.045
EARNINGS ($000)-- 0-2	-0.679	0.638	-0.336	0.031	0.572	0.355	-0.044	-0.174	-0.139
" " -- 2-3	-0.619	0.167	-0.392	-0.114	0.535	0.529	-0.105	0.442	-0.015
" " -- 3-4	-0.271	-0.063	-0.276	-0.167	0.238	0.355	-0.180	0.824	0.142
" " -- 4-5	0.401	-0.122	-0.183	-0.083	-0.164	0.035	-0.298	0.873	0.151
" " -- 5-6	0.736	-0.248	0.040	-0.016	-0.406	-0.195	-0.172	0.550	0.241
" " -- 6-7	0.754	-0.421	0.309	-0.033	-0.468	-0.304	0.008	0.203	0.260
" " -- 7-8	0.688	-0.503	0.477	0.011	-0.437	-0.325	0.189	-0.042	0.181
" " -- 8-10	0.569	-0.519	0.603	0.046	-0.398	-0.366	0.340	-0.199	0.116
" " -- 10-15	0.408	-0.472	0.703	0.071	-0.360	-0.374	0.489	-0.290	0.039
" " -- 15+	0.216	-0.455	0.665	0.168	-0.191	-0.331	0.652	-0.325	-0.055
YEARS OF EDUCATION-- 5-7	-0.040	0.241	-0.865	0.132	0.320	0.512	-0.184	0.256	-0.286
" " " -- 8	0.088	0.223	-0.805	0.304	0.267	0.305	-0.184	0.187	-0.027
" " " -- 9-11	0.018	0.386	-0.710	-0.153	0.187	0.349	-0.226	0.099	0.378
" " " -- 12	0.029	-0.099	0.161	-0.176	-0.299	-0.066	-0.130	0.244	0.877
" " " -- 13-15	0.055	-0.114	0.804	-0.008	-0.398	-0.404	0.234	-0.221	0.443
" " " -- 16	0.093	-0.211	0.887	0.081	-0.385	-0.422	0.337	-0.314	0.079
" " " -- 17+	-0.027	-0.220	0.885	0.065	-0.314	-0.431	0.371	-0.317	-0.006
WEEKS WORKED PREVIOUS YEAR-- 1-13	-0.539	0.716	-0.350	-0.121	0.565	0.498	-0.276	-0.077	-0.053
" " " " --14-26	-0.471	0.660	-0.377	-0.204	0.681	0.589	-0.327	-0.052	-0.130
" " " " --27-39	-0.174	0.431	-0.449	-0.096	0.800	0.473	-0.372	0.157	-0.220
" " " " --40-49	-0.108	0.146	-0.453	-0.077	0.828	0.375	-0.237	0.246	-0.279
" " " " --50-52	0.352	-0.565	0.469	0.118	-0.825	-0.468	0.350	0.020	0.218
HOURS-- 1-14	-0.495	0.658	-0.101	0.086	0.536	0.210	0.068	-0.310	-0.104
" -- 15-29	-0.536	0.552	-0.211	0.036	0.731	0.288	-0.014	-0.262	-0.060
" -- 30-34	-0.469	0.197	-0.369	0.040	0.891	0.384	-0.153	-0.036	-0.211
" -- 35-39	-0.557	-0.225	0.358	-0.155	0.465	0.208	-0.021	-0.164	0.305
" -- 40	0.303	-0.202	-0.172	-0.282	-0.179	0.232	-0.713	0.585	0.156
" -- 41-48	0.147	-0.499	0.277	0.145	-0.360	-0.223	0.710	0.046	0.038
" -- 49-59	0.362	-0.211	0.297	0.230	-0.392	-0.342	0.856	-0.113	-0.063
" -- 60+	0.287	0.000	0.290	0.420	-0.342	-0.391	0.800	-0.275	-0.220
AGE OF EMPLOYED-- 14-17	-0.428	0.670	-0.361	-0.337	0.379	0.415	-0.113	-0.088	0.110
" " " -- 18-19	-0.436	0.574	-0.376	-0.538	0.366	0.479	-0.342	0.161	0.255
" " " -- 20-24	-0.321	0.330	-0.102	-0.753	0.247	0.436	-0.405	0.395	0.275
" " " -- 25-29	0.108	-0.131	0.308	-0.797	-0.068	0.264	-0.180	0.364	0.027
" " " -- 30-34	0.347	-0.487	0.426	-0.550	-0.261	0.079	0.013	0.228	-0.066
" " " -- 35-44	0.422	-0.690	0.275	-0.087	-0.317	-0.095	0.079	0.059	-0.024
" " " -- 45-54	0.115	-0.398	-0.122	0.714	-0.032	-0.191	0.189	0.087	-0.094
" " " -- 55-59	0.095	-0.142	-0.138	0.896	-0.019	-0.225	0.190	-0.008	-0.199
" " " -- 60-64	0.088	-0.043	-0.104	0.929	-0.051	-0.253	0.212	-0.061	-0.175
" " " -- 65-69	-0.102	0.134	0.026	0.885	0.013	-0.225	0.350	-0.237	-0.196
" " " -- 70-74	-0.202	0.131	0.131	0.772	0.056	-0.189	0.462	-0.322	-0.248

APPENDIX B. FACTOR SCORE MATRIX

	1	2	3	4	5	6	7	8	9
1 ACCOUNTANTS AND AUDITORS	0.13	-0.72	1.75	-0.08	-0.90	-0.76	0.05	-0.20	0.52
2 ACTORS AND ACTRESSES	-0.35	0.84	1.61	-0.36	1.31	3.65	0.25	-0.63	-0.18
3 AIRPLANE PILOTS AND NAVIGATORS	0.47	-1.38	1.48	-1.93	0.55	1.00	1.18	-2.22	0.33
4 ARCHITECTS	0.27	-1.14	1.80	0.09	-0.87	-0.17	1.05	-1.54	-1.36
5 ARTISTS AND ART TEACHERS	-0.35	-0.32	1.66	-0.53	0.78	0.15	-0.00	-0.16	0.20
6 ATHLETES	0.30	1.24	1.11	-2.22	0.91	0.62	0.54	-0.14	0.16
7 AUTHORS	-0.12	-0.13	1.95	-0.02	0.33	0.05	-0.06	-0.73	-0.48
8 CHIROPRACTORS	-0.43	-1.28	1.78	1.12	0.54	-2.48	1.49	-0.70	-1.39
9 CLERGYMEN	0.60	0.74	0.84	0.64	-1.32	-2.14	1.42	0.47	-2.19
10 COLLEGE PRESIDENTS AND FACULTY	-0.09	-0.47	2.12	-0.20	1.03	-1.54	0.62	-0.57	-2.66
11 DANCERS AND DANCING TEACHERS	-0.89	1.02	0.74	-1.89	1.91	0.59	-0.15	-0.57	0.55
12 DENTISTS	-0.45	-2.19	1.90	0.72	1.40	-2.26	1.98	-1.61	-2.85
13 DESIGNERS	-0.06	-0.83	1.74	-0.59	-0.23	0.36	0.14	-0.53	0.42
14 DIETITIANS AND NUTRITIONISTS	-1.07	0.07	0.78	0.56	0.19	-0.10	-0.45	0.58	-0.20
15 DRAFTSMEN	0.79	0.28	1.54	-1.79	-1.16	-0.10	-0.71	0.59	1.13
16 EDITORS AND REPORTERS	-0.52	-0.32	1.80	-0.20	0.04	0.24	0.32	-0.46	0.22
17 AERONAUTICAL ENGINEERS	1.69	-0.90	1.80	-2.03	-2.61	-0.65	-1.19	-1.62	-1.79
18 CHEMICAL ENGINEERS	0.72	-1.25	2.05	-1.56	-1.33	-0.23	-0.18	-1.74	-1.75
19 CIVIL ENGINEERS	1.09	-0.57	1.38	-0.07	-1.18	-0.41	0.09	-0.85	-0.81
20 ELECTRICAL ENGINEERS	0.85	-1.46	1.89	-1.53	-1.77	-0.39	-0.22	-1.55	-0.83
21 INDUSTRIAL ENGINEERS	0.80	-2.14	1.41	-1.24	-1.83	-0.79	-0.27	-1.38	0.09
22 MECHANICAL ENGINEERS	1.26	-1.18	1.43	-0.78	-1.80	-0.10	0.04	-1.48	-0.92
23 METALLURGICAL AND METALLURGISTS	1.03	-1.03	1.71	-0.99	-1.73	-0.98	-0.42	-1.12	-1.14
24 MINING ENGINEERS	1.33	-1.10	1.45	-0.91	-1.36	-1.12	0.67	-1.25	-2.25
25 SALES ENGINEERS	0.89	-2.39	1.55	-0.91	-2.02	0.04	1.22	-2.02	-0.73
26 ENGINEERS, N.E.C.	0.82	-1.13	1.44	-0.45	-1.21	-0.17	0.29	-1.57	-0.73
27 ENTERTAINERS , N.E.C.	-0.53	0.60	0.73	-0.86	1.23	1.59	0.84	-0.28	0.24
28 FARM AND HOME MANAGEMENT ADVISORS	0.38	0.21	1.87	-0.53	-1.41	-0.98	0.42	0.62	-1.18
29 FORESTERS AND CONSERVATIONISTS	0.89	0.66	0.66	-0.11	-1.30	1.17	0.10	0.32	-0.83
30 FUNERAL DIRECTORS AND EMBALMERS	0.31	-0.13	1.02	0.79	-1.24	-1.31	1.47	-0.37	0.11
31 LAWYERS AND JUDGES	-0.28	-1.57	1.92	0.63	-0.41	-1.09	1.75	-1.39	-2.01
32 LIBRARIANS	-0.82	0.56	1.39	0.62	0.86	-1.22	-1.48	0.06	0.16
33 MUSICIANS AND MUSIC TEACHERS	-0.54	0.78	1.15	0.15	1.77	-0.72	0.00	-0.60	-0.45
34 NATURAL SCIENTISTS	0.38	-0.86	1.97	-1.45	-0.89	-0.19	-0.48	-0.74	-1.31
35 NURSES, PROFESSIONAL	-1.27	0.20	1.39	-0.03	0.26	-0.41	-0.76	1.21	0.37
36 NURSES, STUDENT PROFESSIONAL	-1.90	1.34	0.17	-2.17	0.90	-3.50	-2.07	-1.84	1.44
37 OPTOMETRISTS	-0.35	-1.88	1.81	0.19	-0.34	-1.55	2.02	-1.58	-1.49
38 OSTEOPATHS	-0.32	-1.27	1.91	1.54	0.60	-2.97	2.23	-1.39	-2.92
39 PERSONNEL AND LABOR RELATIONS WORKERS	-0.27	-1.49	1.62	-0.20	-0.72	-0.58	-0.36	-0.48	0.71
40 PHARMACISTS	0.51	0.09	1.83	0.86	-0.94	-1.29	1.51	-0.74	-1.05
41 PHOTOGRAPHERS	-0.10	-0.21	1.12	-0.27	-0.27	0.20	0.82	-0.11	0.94
42 PHYSICIANS AND SURGEONS	-0.28	-1.05	1.59	0.25	-0.11	-2.37	2.07	-1.49	-3.88
43 PUBLIC RELATIONS MEN & PUBLICITY WRITERS	-0.35	-0.92	1.79	-0.02	-0.01	0.35	0.53	-0.75	0.04
44 RADIO OPERATORS	0.66	-0.10	0.84	-1.27	-1.36	0.15	-0.40	0.26	0.70
45 RECREATION AND GROUP WORKERS	0.01	2.16	1.43	-0.41	-0.46	0.71	0.17	-0.16	0.00
46 RELIGIOUS WORKERS	-0.77	1.30	0.95	0.47	0.04	-2.05	0.56	-0.70	-0.29
47 SOCIAL AND WELFARE WORKERS, EXC. GROUP	-0.46	-0.31	1.76	0.42	0.00	-0.71	-0.79	0.71	-0.60
48 SOCIAL SCIENTISTS	-0.28	-1.02	1.91	-0.59	-0.13	-0.49	-0.31	-0.63	-0.46
49 SPORTS INSTRUCTORS AND OFFICIALS	0.13	0.48	1.64	-1.59	0.87	-0.15	0.29	0.38	-1.11
50 SURVEYORS	0.57	1.14	0.92	-0.88	-0.79	0.58	0.16	0.85	0.52
51 TEACHERS, ELEMENTARY SCHOOLS	-0.73	-0.28	2.09	0.32	2.40	-1.91	-1.27	0.91	-1.19
52 TEACHERS, SECONDARY SCHOOLS	-0.24	-0.78	2.15	-0.28	1.66	-1.80	-0.26	0.68	-2.34
53 TEACHERS, N.E.C.	-0.50	0.34	1.56	0.24	1.31	-0.81	-0.16	0.05	-0.72
54 TECHNICIANS, MEDICAL AND DENTAL	-0.80	0.15	1.27	-1.30	-0.27	-0.23	-0.03	1.05	0.76

	1	2	3	4	5	6	7	8	9
55 TECHNICIANS, ELECTRICAL AND ELECTRONIC	1.02	-0.18	0.96	-2.34	-1.27	-0.69	-0.77	0.53	0.89
56 TECHNICANS, OTHER ENG. & PHYS. SCIENCES	0.61	0.12	1.14	-1.65	-1.03	-0.20	-0.89	0.60	0.89
57 TECHNICIANS, N.E.C.	0.14	0.72	1.14	-0.90	-0.49	-0.45	-0.20	0.53	0.72
58 THERAPISTS AND HEALERS, N.E.C.	-0.60	-0.24	1.48	0.18	0.61	-0.42	0.13	0.33	-0.65
59 VETERINARIANS	0.87	0.00	1.46	-0.27	-1.24	-1.35	1.59	-1.79	-3.27
60 PROFESSIONAL, TECHNICAL & KW (N.E.C.)	-0.03	0.09	1.67	-0.84	0.08	-0.27	0.05	-0.34	-0.23
61 FARMERS (OWNERS AND TENANTS)	-0.13	0.66	-0.39	1.60	-0.21	-1.26	1.38	-0.85	-0.55
62 FARM MANAGERS	0.41	-0.11	0.03	0.62	-1.22	-2.07	1.87	0.34	-0.75
63 BUYERS AND DEPARTMENT HEADS, STORE	-0.27	-1.22	0.85	-0.04	-1.08	-0.32	1.41	-0.08	0.98
64 BUYERS AND SHIPPERS, FARM PRODUCTS	0.29	0.12	0.21	1.43	-0.42	0.07	1.52	-0.35	0.04
65 CONDUCTORS, RAILROAD	2.09	-0.42	-0.46	2.44	-0.56	-0.15	0.48	-1.62	0.76
66 CREDIT MEN	-0.35	-1.37	1.43	-0.43	-0.86	-0.16	0.52	0.65	1.06
67 FLOOR MEN AND FLOOR MANAGERS, STORE	-1.11	-0.68	0.47	-0.17	0.04	0.43	0.99	0.24	1.24
68 INSPECTORS, PUBLIC ADMINISTRATION	1.04	-0.04	0.89	1.37	-1.94	-0.06	-0.72	-0.26	1.02
69 MANAGERS AND SUPERINTENDENTS, BUILDING	-0.58	0.11	0.10	2.73	-0.45	-1.07	1.04	-0.74	-0.01
70 OFFICIERS, PILOTS, PURSERS & ENGS., SHIP	1.76	0.65	-0.19	0.83	0.05	0.21	0.82	-0.82	-0.32
71 OFFICIALS & ADMIN. (N.E.C.), PUB. ADMIN.	0.07	-0.41	1.14	1.58	-1.11	-0.61	0.02	-0.51	0.92
72 OFFICIALS, LODGE, SOCIETY, UNION, ETC.	0.16	-0.61	0.69	1.28	-0.78	-0.39	0.89	-1.01	0.99
73 POSTMASTERS	-0.17	-0.66	0.49	2.79	-2.11	-1.14	1.14	-0.43	1.54
74 PURCHASING AGENTS AND BUYERS, N.E.C.	0.32	-1.53	1.17	0.17	-1.36	-0.55	0.12	-0.56	1.07
75 MGRS, OFF'S & PROPR'S--SAL, CONSTRUCTION	0.65	-1.28	0.59	0.61	-0.62	0.22	0.89	-1.09	0.19
76 MGRS, OFF'S & PROPR'S--SAL, MFG.	-0.16	-1.98	1.06	0.46	-1.54	-0.45	1.36	-1.49	0.70
77 MGRS, OFF'S & PROPR'S--SAL, TRANS.	0.66	-1.33	0.72	1.00	-1.89	-1.00	0.97	-0.99	1.00
78 MGRS, OFF'S & PROPR'S--SAL, COMM. & UTIL.	-0.06	-1.71	1.17	0.67	-2.15	-0.50	0.50	-0.96	1.27
79 MGRS, OFF'S & PROPR'S--SAL, WHOLESALE	0.07	-1.51	0.90	0.42	-1.21	-0.53	1.56	-0.78	0.87
80 MGRS, OFF'S & PROPR'S--SAL, RETAIL	0.07	-0.62	0.59	-0.09	-1.25	-0.51	1.92	0.31	0.77
81 MGRS, OFF'S & PROPR'S--SAL, BANK & FIN.	-0.36	-1.43	1.58	0.35	-1.16	-1.16	0.88	-0.39	1.03
82 MGRS, OFF'S & PROPR'S--SAL, INS. & REAL EST.	-0.59	-1.81	1.50	0.65	-1.17	-0.39	1.13	-1.04	1.05
83 MGRS, OFF'S & PROPR'S--SAL, BUSINESS SERV.	-0.66	-1.85	1.55	-0.23	-0.27	-0.16	0.90	-0.54	0.56
84 MGRS, OFF'S & PROPR'S--SAL, AUTO SERV.	0.37	-1.00	0.21	-0.24	-1.64	-0.93	2.32	0.55	0.76
85 MGRS, OFF'S & PROPR'S--SAL, MISC. REPAIR	0.28	-1.80	0.63	-0.18	-1.37	-0.82	1.46	-0.35	1.02
86 MGRS, OFF'S & PROPR'S--SAL, PERSONAL SERV.	-0.40	0.09	0.60	1.11	-0.67	-0.05	1.39	-0.11	0.54
87 MGRS, OFF'S & PROPR'S--SAL, OTHER	-0.50	-0.58	1.01	0.95	0.13	-0.33	0.94	-0.37	0.53
88 MGRS, OFF'S & PROPR'S--SE, CONSTRUCTION	0.59	-0.95	0.27	1.03	0.37	-0.22	1.38	-0.81	-0.21
89 MGRS, OFF'S & PROPR'S--SE, MFG.	-0.06	-1.00	0.50	1.57	-0.33	-1.11	1.66	-1.10	0.20
90 MGRS, OFF'S & PROPR'S--SE, TRANS.	0.13	-0.73	0.27	1.35	-0.37	-0.95	1.50	-0.77	-0.03
91 MGRS, OFF'S & PROPR'S--SE, COMM. & UTIL.	0.09	-1.00	0.70	1.20	-0.82	-1.85	1.62	-0.88	-0.01
92 MGRS, OFF'S & PROPR'S--SE, WHOLESALE	-0.00	-0.74	0.47	1.59	-0.39	-1.22	1.79	-0.99	0.15
93 MGRS, OFF'S & PROPR'S--SE, RETAIL	-0.10	-0.28	0.15	1.73	-0.92	-1.44	2.03	-0.48	0.16
94 MGRS, OFF'S & PROPR'S--SE, BANK & FIN.	-0.16	-0.64	1.16	2.15	0.26	-2.04	1.36	-1.62	-0.40
95 MGRS, OFF'S & PROPR'S--SE, INS. & REAL EST.	-0.26	-0.49	0.91	2.14	-0.18	-1.82	1.53	-1.45	0.11
96 MGRS, OFF'S & PROPR'S--SE, BUSINESS SERV.	-0.46	-1.16	1.03	1.41	0.15	-1.25	1.34	-0.93	0.20
97 MGRS, OFF'S & PROPR'S--SE, AUTO SERV.	0.37	-0.90	-0.31	1.13	-0.95	-1.93	2.33	-0.25	0.09
98 MGRS, OFF'S & PROPR'S--SE, MISC. REPAIR	-0.08	-1.04	0.03	1.36	-0.26	-0.59	1.81	-0.25	0.14
99 MGRS, OFF'S & PROPR'S--SE, PERSONAL SERV.	-0.38	-0.07	0.35	2.14	-0.49	-1.40	1.18	-0.56	0.18
100 MGRS, OFF'S & PROPR'S--SE, OTHER	-0.27	0.00	0.52	1.72	0.01	-0.94	1.24	-0.79	-0.03
101 AGENTS , N.E.C.	0.13	-0.19	1.41	0.36	-0.62	0.03	0.13	-0.10	0.78
102 ATTENDANTS AND ASSISTANTS, LIBRARY	-1.28	2.06	0.73	-0.83	0.54	-1.40	-2.17	-0.55	1.12
103 ATTENDANTS, PHYS'S & DENT'S OFFICE	-2.55	-0.15	0.66	-1.33	0.60	0.30	-0.11	0.20	1.58
104 BAGGAGEMEN, TRANSPORTATION	1.33	0.87	-0.88	0.48	-1.10	-0.87	-1.25	1.49	0.69
105 BANK TELLERS	-1.96	-0.96	1.13	-1.60	0.33	-0.28	-1.30	1.44	2.07
106 BOOKKEEPERS	-1.72	-0.42	0.90	-0.36	0.26	0.07	-0.29	0.80	2.04
107 CASHIERS	-1.41	0.78	-0.11	-0.65	0.55	0.29	-0.01	-0.39	1.58
108 COLLECTORS , BILL AND ACCOUNT	-0.19	0.65	0.77	0.08	-0.31	-0.16	0.68	0.69	0.65
109 DISPATCHERS AND STARTERS, VEHICLE	0.60	-0.05	0.15	-0.15	-1.17	0.00	0.28	0.62	0.87
110 EXPRESS MES'GERS & RAILWAY MAIL CLERKS	1.60	0.92	-0.09	1.57	-1.54	-1.62	-1.29	-0.08	1.42
111 FILE CLERKS	-1.71	0.87	0.12	-0.90	0.20	0.30	-1.59	0.27	1.80
112 INSURANCE ADJ'RS, EXAM'RS, & INVEST'RS	0.07	-1.19	1.69	-1.43	-0.77	-0.03	0.29	0.56	0.51
113 MAIL CARRIERS	1.10	0.62	0.32	0.04	-1.67	-0.24	-0.51	0.40	0.86
114 MESSENGERS AND OFFICE BOYS	-0.57	2.43	-0.53	-0.08	0.26	-0.10	-0.99	-0.98	1.19

	1	2	3	4	5	6	7	8	9
115 OFFICE MACHINE OPERATORS	-1.32	-0.27	0.75	-2.05	-0.02	0.05	-1.27	1.40	2.13
116 PAYROLL AND TIMEKEEPING CLERKS	-0.68	-0.33	0.75	-0.34	-0.52	0.08	-1.16	1.42	1.51
117 POSTAL CLERKS	0.70	0.67	0.57	0.28	-1.32	-0.01	-1.36	0.46	1.06
118 RECEPTIONISTS	-2.53	0.20	0.72	-0.77	0.45	0.50	-1.01	0.30	1.64
119 SECRETARIES	-1.94	-0.31	1.37	-1.03	0.27	-0.28	-1.45	1.12	2.39
120 SHIPPING AND RECEIVING CLERKS	-0.02	0.17	-0.38	-0.69	-0.62	0.09	-0.18	1.55	0.90
121 STENOGRAPHERS	-1.88	-0.39	1.10	-0.99	0.21	-0.30	-1.85	1.36	2.28
122 STOCK CLERKS AND STOREKEEPERS	0.04	1.14	-0.26	-0.36	-0.45	0.03	-0.45	0.70	1.15
123 TELEGRAPH MESSENGERS	-0.31	1.96	-1.30	-1.46	-0.06	0.87	-0.96	-1.01	1.14
124 TELEGRAPH OPERATORS	1.00	0.73	0.44	0.58	-1.57	-1.12	-1.40	1.35	0.74
125 TELEPHONE OPERATORS	-1.92	-0.38	0.28	-0.66	0.25	0.29	-1.39	1.19	1.89
126 TICKET, STATION, AND EXPRESS AGENTS	0.67	0.36	0.88	0.01	-1.50	-0.90	-0.81	1.12	0.89
127 TYPISTS	-1.84	0.32	0.62	-1.57	0.34	0.29	-2.37	0.99	1.99
128 CLERICAL AND KINDRED WORKERS, N.E.C.	-0.91	0.13	0.78	-0.18	-0.01	0.19	-0.61	0.51	1.45
129 ADVERTISING AGENTS AND SALESMEN	-0.13	-0.52	1.55	-0.08	-0.18	0.18	0.57	-0.22	0.60
130 AUCTIONEERS	0.48	0.58	0.20	1.30	0.11	-0.84	1.26	-0.79	0.25
131 DEMONSTRATORS	-1.10	1.01	0.41	-0.24	1.10	0.29	-1.56	-1.90	0.22
132 HUCKSTERS AND PEDDLERS	-0.65	1.14	0.30	0.78	1.12	-0.26	0.05	-1.45	-0.02
133 INSURANCE AGENTS, ETC.	-0.13	-1.08	1.30	0.03	-0.11	-0.27	1.25	-0.17	0.56
134 NEWSBOYS	0.56	3.74	-2.56	-1.08	-0.59	-2.15	-0.74	-4.11	-0.25
135 REAL ESTATE AGENTS AND BROKERS	-0.33	-0.32	0.88	1.66	0.42	-0.99	1.24	-0.72	0.25
136 STOCK AND BOND SALESMEN	-0.08	-0.24	1.28	0.66	0.33	-0.58	0.99	-0.94	0.01
137 SALESMEN & SALES CLERKS (N.E.C.) MFG.	0.03	-0.61	1.12	-0.09	-0.43	0.47	1.10	-0.67	0.53
138 SALESMEN & SALES CLERKS (N.E.C.) WHOLESALE	0.31	-0.68	0.86	0.14	-0.75	0.01	1.30	-0.16	0.61
139 SALESMEN & SALES CLERKS (N.E.C.) RETAIL	-0.93	0.70	0.15	0.38	0.38	0.41	1.01	-0.61	1.25
140 SALESMEN & SALES CLERKS (N.E.C.) OTHER IND.	-0.38	0.19	0.82	0.21	0.11	0.92	0.93	-0.47	0.83
141 BAKERS	-0.21	-0.12	-0.38	0.44	0.03	0.09	1.03	0.55	0.56
142 BLACKSMITHS	0.91	0.58	-1.39	1.68	0.58	-0.62	0.20	0.46	-0.87
143 BOILERMAKERS	2.44	0.33	-1.25	0.84	0.48	-0.53	-1.73	0.37	-0.51
144 BOOKBINDERS	-1.40	-1.08	0.07	-0.01	0.81	0.60	-0.58	0.25	1.57
145 BRICKMASONS, ETC.	0.92	-0.05	-0.29	-0.68	2.12	0.70	-0.49	0.33	-0.33
146 CABINETMAKERS	0.59	0.28	-0.36	0.47	-0.04	0.37	0.56	0.78	0.09
147 CARPENTERS	0.85	0.24	-0.62	0.53	1.54	0.84	0.01	0.39	-0.43
148 CEMENT AND CONCRETE FINISHERS	1.19	0.17	-1.00	-0.35	2.10	0.67	-0.23	0.41	-1.15
149 COMPOSITORS AND TYPESETTERS	-0.12	-0.75	0.57	-0.11	0.07	-0.22	0.24	-0.09	2.00
150 CRANEMEN, DERRICKMEN, AND HOISTMEN	1.56	-0.50	-1.07	0.11	0.46	-0.15	-1.10	0.77	-0.63
151 DECORATORS AND WINDOW DRESSERS	-0.75	0.23	0.71	0.03	0.15	0.09	0.87	0.07	0.88
152 ELECTRICIANS	1.35	-0.51	-0.06	-0.21	-0.13	-0.03	-0.47	-0.05	0.77
153 ELECTROTYPERS AND STEREOTYPERS	0.93	-1.16	0.38	-0.04	-0.01	-0.86	0.44	-1.21	1.77
154 ENGRAVERS, EXCEPT PHOTOENGRAVERS	-0.28	-0.49	0.32	-0.18	-0.07	0.21	0.54	-0.12	1.54
155 EXCAVATING MACHINERY OPERATORS	0.99	-0.58	-1.02	-0.74	0.90	0.61	0.64	0.71	-0.30
156 FOREMEN, N.E.C.	0.56	-1.53	0.15	0.56	-1.16	-0.36	0.46	-0.48	1.02
157 FORGEMEN AND HAMMERMEN	0.52	-1.40	-0.82	0.36	0.89	0.38	-1.11	0.01	0.43
158 FURRIERS	-0.06	-0.58	0.29	2.30	1.15	0.82	-0.20	-0.09	0.66
159 GLAZIERS	0.42	-0.80	-0.67	-1.35	0.15	0.70	0.56	0.34	0.96
160 HEAT TREATERS, ANNEALERS, AND TEMPERERS	1.31	-0.41	-0.96	0.46	-0.41	-0.41	-0.82	0.72	0.50
161 INSPECTORS & GRADERS, LOG & LUMBER	0.27	0.01	-0.31	0.45	-0.12	0.21	0.10	1.11	0.09
162 INSPECTORS, N.E.C.	0.93	0.04	0.29	0.94	-0.94	0.31	-0.90	0.45	0.41
163 JEWELERS, WATCHMAKERS, ETC.	-0.19	-0.53	0.21	0.65	-0.11	0.30	1.37	0.24	0.63
164 JOB SETTERS, METAL	1.44	-1.50	-1.36	-0.69	-0.62	-0.96	-0.71	0.23	0.58
165 LINEMEN AND SERVICEMEN	1.60	-0.55	0.28	-1.88	-2.49	-0.91	-1.17	0.77	0.61
166 LOCOMOTIVE ENGINEERS	2.54	0.18	-0.93	2.81	-0.24	-2.43	0.69	-1.93	0.52
167 LOCOMOTIVE FIREMEN	1.78	-0.23	-0.59	-0.76	0.44	-1.10	0.18	0.06	0.54
168 LOOM FIXERS	0.08	-2.07	-2.17	-0.26	-0.80	0.59	0.92	2.08	-1.75
169 MACHINISTS	1.32	-0.19	-0.51	0.24	-0.87	-0.43	-0.50	0.62	0.68
170 MECHANICS & REPAIRMEN, A/C, HEAT & REFRIG	1.16	0.02	-0.35	-0.81	-0.19	-0.30	0.82	0.28	0.60
171 MECHANICS AND REPAIRMEN, AIRPLANE	1.60	-0.66	0.09	-1.36	-1.34	-0.62	-1.31	0.12	0.65
172 MECHANICS AND REPAIRMEN, AUTOMOBILE	0.79	-0.09	-1.10	-0.99	-0.61	-0.55	1.55	0.97	0.01
173 MECHANICS AND REPAIRMEN, OFFICE MACHINE	0.83	-0.44	0.45	-1.89	-1.08	-0.73	-0.39	1.08	0.81
174 MECHANICS & REPAIRMEN, RADIO & TV	0.42	0.04	0.15	-1.53	-0.59	-0.00	1.31	0.58	0.39

	1	2	3	4	5	6	7	8	9
175 MECHANICS & REPAIRMEN, RR & CAR SHOP	3.04	1.68	-1.60	1.34	-1.73	-1.19	-2.29	1.41	-1.26
176 MECHANICS AND REPAIRMEN, N.E.C.	0.91	0.14	-0.41	0.31	-0.63	-0.27	0.27	0.72	0.27
177 MILLERS, GRAIN, FLOUR, FEED, ETC.	0.66	0.21	-1.42	0.31	-0.69	-1.20	1.86	0.93	-0.24
178 MILLWRIGHTS	2.46	-0.62	-1.68	0.68	0.26	-1.34	-0.55	-0.13	-0.09
179 MOLDERS, METAL	0.43	-0.83	-0.90	-0.18	0.96	0.17	-1.04	0.94	-0.33
180 MOTION PICTURE PROJECTIONISTS	0.18	0.89	-0.41	0.97	0.76	-1.00	0.87	-0.73	1.34
181 OPTICIANS, AND LENS GRINDERS AND POLISHERS	-0.17	-0.82	0.36	-0.34	-0.63	-0.31	0.16	0.44	1.11
182 PAINTERS, CONSTRUCTION AND MAINTENANCE	0.30	0.52	-0.44	0.84	1.30	0.97	-0.23	0.16	-0.14
183 PAPERHANGERS	-0.35	0.33	-0.42	1.75	2.00	0.89	-0.22	-0.54	-0.55
184 PATTERN AND MODEL MAKERS, EXCEPT PAPER	1.60	-0.43	0.16	0.27	-0.68	-0.34	-0.42	-0.46	1.10
185 PHOTOENGRAVERS AND LITHOGRAPHERS	0.01	-1.48	0.97	-0.68	-0.10	-0.07	0.08	-0.79	1.70
186 PIANO AND ORGAN TURNERS AND REPAIRMEN	0.08	0.47	0.05	1.22	0.56	0.20	1.04	0.00	0.07
187 PLASTERERS	0.81	-0.17	-0.56	-0.11	2.33	1.56	-0.74	0.02	-0.54
188 PLUMBERS AND PIPE FITTERS	1.14	-0.42	-0.49	0.16	0.58	0.49	-0.21	-0.07	0.41
189 PRESSMEN AND PLATE PRINTERS, PRINTING	0.16	-1.04	0.29	-0.83	-0.05	-0.21	0.06	-0.18	1.92
190 ROLLERS AND ROLL HANDS, METAL	0.78	-0.72	-0.61	0.14	1.14	0.10	-1.67	0.57	0.01
191 ROOFERS AND SLATERS	0.98	0.59	-1.12	-0.96	2.27	0.51	-0.00	0.45	-0.96
192 SHOEMAKERS AND REPAIRERS, EXCEPT FACTORY	-0.34	0.30	-0.95	1.38	-0.14	-0.93	1.91	0.17	-0.93
193 STATIONARY ENGINEERS	1.42	-0.09	0.44	0.69	-1.37	-0.44	-0.04	-0.28	-0.04
194 STONECUTTERS AND STONE CARVERS	0.23	-0.43	-0.23	0.86	0.57	0.55	0.12	0.97	-0.56
195 STRUCTURAL METAL WORKERS	1.52	-0.01	-0.57	-0.14	1.01	0.66	-1.35	0.05	0.24
196 TAILORS AND TAILORESSES	-0.33	0.28	-0.48	2.39	0.37	-0.18	0.60	0.59	-0.45
197 TIN, COPPER & SHEET METAL WORKERS	1.17	-0.41	-0.38	-0.58	-0.01	0.43	-0.91	0.42	0.73
198 TOOLMAKERS, AND DIE MAKERS AND SETTERS	1.83	-0.59	-0.32	0.10	-0.93	-0.94	0.14	-0.47	0.89
199 UPHOLSTERERS	-0.30	-0.48	-0.59	-0.27	0.61	0.19	0.75	0.69	0.48
200 CRAFTSMEN AND KINDRED WORKERS, N.E.C.	0.78	0.16	-0.11	-0.82	0.25	0.51	0.02	-0.15	0.78
201 APPRENTICES	0.24	1.59	-0.79	-2.86	0.17	-0.74	-0.52	1.09	1.74
202 ASBESTOS AND INSULATION WORKERS	1.01	-0.42	-0.30	-1.29	0.45	1.17	-1.42	-0.18	0.99
203 ASSEMBLERS	-0.46	-0.40	-0.67	-0.95	0.54	1.29	-1.37	1.03	0.63
204 ATTENDANTS, AUTO SERVICE AND PARKING	0.10	1.99	-0.87	-1.20	0.08	-0.13	1.46	-0.05	0.28
205 BLASTERS AND POWDERMEN	0.48	-0.51	-0.56	-0.31	1.22	1.35	0.04	0.99	-0.84
206 BOATMEN, CANALMEN, AND LOCK KEEPERS	1.45	1.67	-0.34	0.60	-0.71	0.08	-0.07	0.41	-0.49
207 BRAKEMEN, RAILROAD	1.95	0.01	-0.56	0.04	0.21	0.40	0.09	0.00	-0.02
208 BUS DRIVERS	0.12	0.04	-0.75	0.48	0.72	-1.57	0.51	0.13	0.54
209 CHAINMEN, RODMEN, AND AXMEN, SURVEYING	0.03	1.68	-0.53	-1.40	0.17	0.85	-0.16	0.62	0.69
210 CHECKERS, EXAMINERS, AND INSPECTORS, MFG.	-0.53	-0.93	-0.11	-0.32	0.39	0.68	-1.01	0.77	0.97
211 CONDUCTORS, BUS AND STREET RAILWAY	1.86	0.46	-1.61	1.25	-2.24	-2.32	-2.11	1.51	-0.35
212 DELIVERYMEN AND ROUTEMEN	0.54	1.10	-0.37	-1.10	-0.57	0.03	1.33	0.08	0.87
213 DRESSMAKERS AND SEAMSTRESSES EXCEPT FAC.	-1.78	0.32	-0.28	2.41	1.19	0.06	-0.49	-1.15	-0.25
214 DRYERS	-0.47	-0.76	-0.50	-0.45	0.12	0.93	0.70	1.23	-0.56
215 FILERS, GRINDERS, AND POLISHERS, METAL	0.60	-0.41	-0.84	0.06	0.34	0.23	-0.63	0.69	0.38
216 FRUIT, NUT & VEGETABLE GRADERS & PACKERS	-1.52	0.68	-0.65	0.08	1.69	3.34	-0.34	-1.59	-0.82
217 FURNACEMEN, SMELTERMEN, AND PCURERS	0.82	-0.80	-0.79	-0.12	0.81	-0.11	-1.48	0.82	-0.31
218 GRADERS AND SORTERS, MANUFACTURING	-1.36	-0.29	-0.47	0.11	0.96	2.36	-0.62	0.07	0.11
219 HEATERS, METAL	1.68	-0.28	-0.91	0.91	0.81	0.66	-2.54	0.14	-0.19
220 KNITTERS, LOOPERS, AND TIPPERS TEXTILE	-1.91	-1.56	-1.24	-1.45	1.90	1.10	-0.61	0.56	0.08
221 LAUNDRY AND DRY CLEANING OPERATIVES	-1.66	-0.43	-0.65	0.18	0.75	0.86	0.51	-0.53	-0.13
222 MEAT CUTTERS, EXC SLAUGHTER HOUSE	0.66	0.47	-0.50	0.12	-0.94	-0.42	1.33	0.76	0.60
223 MILLINERS	-2.44	-1.41	-1.00	2.14	2.37	-0.46	-0.12	-0.50	0.83
224 COAL MINE OPEPERATIVES & LABORERS	0.38	-0.85	-1.97	-0.17	2.57	1.24	-1.10	-0.02	-1.71
225 PETROLEUM MINE OPERATIVES & LABORERS	1.58	0.86	-0.39	-1.26	-0.07	1.26	1.19	0.66	-0.30
226 OTHER MINE OPERATIVES & LABORERS	0.61	0.02	-0.63	-0.34	0.24	0.91	0.05	1.27	-0.82
227 MOTORMEN, MINE, FAC., LOG CAMP, ETC.	1.13	-0.16	-1.82	0.05	1.87	0.06	-0.44	0.78	-1.68
228 MOTORMEN, ST., SUBWAY, & ELEVATED RAIL	1.87	0.16	-1.67	1.52	-1.92	-2.36	-1.42	0.23	0.50
229 OILERS AND GREASERS, EXCEPT AUTO	1.16	0.43	-1.08	0.05	-0.09	0.35	-0.39	1.29	-0.57
230 PACKERS AND WRAPPERS, N.E.C.	-1.15	0.15	-0.90	-0.85	0.81	1.45	-0.82	0.12	0.52
231 PAINTERS, EXC CONSTRUCTION & MAINT.	-0.03	-0.18	-0.61	-0.49	0.19	0.86	0.07	1.02	0.17
232 PHOTOGRAPHIC PROCESS WORKERS	-0.76	0.17	0.41	-0.83	0.17	0.69	0.05	0.19	1.41
233 POWER STATION OPERATORS	1.34	-0.42	0.13	0.59	-1.61	-0.70	-1.40	-0.15	0.94
234 SAILORS AND DECK HANDS	1.05	0.86	-0.76	-0.34	0.53	1.97	0.44	0.75	-0.60

	1	2	3	4	5	6	7	8	9
235 SAWYERS	-0.29	-0.15	-0.96	-0.14	1.22	0.72	0.02	0.58	-1.38
236 SEWERS, AND STICHERS, MANUFACTURING	-2.37	-1.25	-0.93	0.04	2.19	1.26	-1.70	-0.34	-0.22
237 SPINNERS, TEXTILE	-2.73	-2.67	-1.71	-0.74	1.74	1.09	-0.55	0.54	-1.52
238 STATIONARY FIREMEN	1.21	0.24	-1.11	1.18	-0.90	-0.35	-0.23	0.96	-0.65
239 SWITCHMEN, RAILROAD	2.06	0.29	-0.67	-0.11	-0.71	-1.66	-1.01	0.42	-0.03
240 TAXICAB DRIVERS AND CHAUFFEURS	-0.02	0.05	-0.73	0.80	0.21	-0.14	1.07	0.79	-0.52
241 TRUCK AND TRACTOR DRIVERS	0.56	-0.20	-0.85	-1.10	0.20	0.55	0.99	0.63	-0.41
242 WEAVERS, TEXTILE	-1.55	-1.60	-1.40	-0.25	0.58	0.48	-0.06	1.48	-0.94
243 WELDERS AND FLAME-CUTTERS	0.69	-0.82	-0.95	-0.94	0.29	0.41	-0.43	0.74	0.31
244 OP'S & K.W. (N.E.C.) SAWMILLS & OTHER WOOD	-0.44	-0.03	-0.62	-0.33	0.60	0.80	0.01	0.77	-0.61
245 OP'S & K.W. (N.E.C.) FURNITURE & FIXTURES	-0.89	-0.52	-0.89	-0.78	0.62	0.87	0.12	1.13	-0.52
246 OP'S & K.W. (N.E.C.) STONE, CLAY & GLASS	0.02	-0.60	-0.58	-0.60	0.35	0.59	-0.63	1.04	-0.09
247 OP'S & K.W. (N.E.C.) PRIMARY METAL	0.69	-0.47	-0.68	-0.25	0.64	0.24	-1.63	1.22	-0.25
248 OP'S & K.W. (N.E.C.) FABR'D METAL	0.03	-0.35	-0.62	-0.69	0.19	0.85	-0.88	1.20	0.26
249 OP'S & K.W. (N.E.C.) MACHINERY EXC ELECT.	0.39	-0.24	-0.66	-0.48	-0.02	0.21	-0.58	1.05	0.57
250 OP'S & K.W. (N.E.C.) ELECTRICAL MACHINERY	-0.55	-0.82	-0.37	-1.34	0.21	0.86	-1.42	1.00	0.77
251 OP'S & K.W. (N.E.C.) TRANS. EQUIP.	0.61	-0.47	-0.62	-0.60	0.49	0.66	-1.38	1.05	0.21
252 OP'S & K.W. (N.E.C.) PROFESS'L, PHOTO & WATCH	-0.41	-0.82	-0.36	-0.74	0.05	0.66	-0.97	0.72	1.00
253 OP'S & K.W. (N.E.C.) MISC. MFG.	-1.05	-0.28	-0.59	-0.19	0.77	1.46	-0.63	0.40	0.01
254 OP'S & K.W. (N.E.C.) FOOD & KINDRED	-0.60	0.02	-0.40	-0.21	0.44	1.75	0.15	0.31	0.27
255 OP'S & K.W. (N.E.C.) TOBACCO	-1.80	-1.37	-1.34	-0.38	1.34	1.93	-1.48	0.69	-1.15
256 OP'S & K.W. (N.E.C.) TEXTILE MILLS	-2.04	-1.64	-1.09	-0.80	1.10	0.96	0.01	0.89	-0.53
257 OP'S & K.W. (N.E.C.) APPAREL & OTHER TEXTILE	-1.86	-1.12	-0.65	-0.21	2.07	1.33	-0.83	-0.17	0.10
258 OP'S & K.W. (N.E.C.) PAPER & ALLIED	-0.24	-0.87	-0.58	-1.12	-0.20	0.19	-0.35	1.30	0.50
259 OP'S & K.W. (N.E.C.) PRINTING & PUBLISHING	-0.84	0.00	-0.04	-0.62	0.49	0.82	-0.23	0.06	1.48
260 OP'S & K.W. (N.E.C.) CHEMICALS & ALLIED	0.54	-0.59	-0.12	-0.91	-0.95	0.08	-1.35	0.90	0.38
261 OP'S & K.W. (N.E.C.) PETROLEUM & COAL	1.64	-0.80	0.12	-0.34	-1.61	-0.44	-1.89	-0.43	0.59
262 OP'S & K.W. (N.E.C.) RUBBER & PLASTIC	-0.45	-0.98	-0.46	-0.91	0.86	0.79	-0.79	0.63	0.89
263 OP'S & K.W. (N.E.C.) LEATHER	-1.43	-0.64	-1.17	-0.10	1.55	1.04	-0.88	0.47	0.04
264 OP'S & K.W. (N.E.C.) NOT SPECIFIED MFG.	-1.02	0.05	-0.41	-0.84	0.73	1.78	-0.64	0.62	-0.09
265 OP'S & K.W. (N.E.C.) CONSTRUCTION	0.39	0.13	-0.42	-0.87	1.21	1.31	0.42	0.53	-0.24
266 OP'S & K.W. (N.E.C.) RAILROAD & RAIL EXPRESS	1.84	0.90	-1.45	1.35	-1.46	-0.23	-2.35	1.74	-1.24
267 OP'S & K.W. (N.E.C.) TRANS. EXC RAILROAD	0.48	0.70	-0.30	-0.19	-0.60	1.05	-0.15	0.61	0.22
268 OP'S & K.W. (N.E.C.) COMM. & UTIL.	0.84	0.28	-0.17	0.28	-1.54	-0.01	-0.57	1.14	0.16
269 OP'S & K.W. (N.E.C.) WHOLESALE & RETAIL	-0.65	0.50	-0.41	-0.23	0.37	1.14	0.54	0.32	0.20
270 OP'S & K.W. (N.E.C.) BUSINESS & REPAIR	-0.31	0.62	-0.23	-0.70	0.08	0.80	0.82	0.46	0.28
271 OP'S & K.W. (N.E.C.) PERSONAL SERVICE	-1.20	0.86	-0.68	0.48	0.46	0.80	0.25	-0.60	-0.25
272 OP'S & K.W. (N.E.C.) PUBLIC ADMINSTRATION	0.67	0.38	-0.10	0.64	-1.39	0.03	-1.43	1.28	-0.16
273 OP'S & K.W. (N.E.C.) ALL OTHER INDUSTRIES	-0.55	1.20	0.03	0.26	0.48	1.00	0.19	-0.19	0.11
274 BABY SITTERS, PRIVATE HOUSEHOLD	-1.25	3.40	-1.23	0.70	0.03	-0.34	-0.78	-3.75	-0.36
275 HOUSEKEEPERS, PRIVATE HOUSEHOLD	-2.27	0.74	-0.92	1.64	0.33	-0.27	0.57	-1.92	-1.25
276 LAUNDRESSES, PRIVATE HOUSEHOLD	-1.88	1.34	-1.21	1.61	0.72	-0.60	-1.13	-3.36	-2.19
277 PRIVATE HOUSEHOLD WORKERS, N.E.C.	-2.04	0.76	-1.02	0.80	1.10	0.14	-0.18	-2.68	-1.90
278 ATTENDANTS, HOSPITAL & OTHER INSTIT.	-1.30	0.58	-0.53	-0.12	-0.34	0.11	-0.52	0.10	0.19
279 ATTENDANTS, PROF'L & PERS'L SERV., N.E.C.	-0.83	1.49	0.18	0.22	0.35	0.46	-0.05	-0.78	0.21
280 ATTENDANTS, RECREATION AND AMUSEMENT	0.10	3.29	-0.83	-0.09	0.31	0.98	0.22	-2.00	0.39
281 BARBERS	0.10	0.06	-0.69	1.12	-0.08	-1.40	2.08	0.79	-0.27
282 BARTENDERS	-0.21	-0.13	-0.14	0.90	0.06	0.62	1.41	0.48	-0.02
283 BOARDING AND LODGING HOUSEKEEPERS	-0.91	1.47	0.06	2.04	-0.21	-0.71	0.70	-1.47	-0.27
284 BOOTBLACKS	-1.02	1.87	-1.49	0.18	0.05	0.34	0.70	-1.75	-1.74
285 CHAMBERMAIDS & MAIDS, EXC PRIV. HOUSE	-2.49	-0.41	-0.79	0.56	1.00	1.19	-0.30	-1.85	-0.96
286 CHARWOMEN AND CLEANERS	-1.21	0.68	-0.86	0.95	1.06	0.35	-0.55	-1.06	-0.68
287 COOKS, EXCEPT PRIVATE HOUSEHOLD	-1.15	0.03	-0.59	0.94	1.07	0.46	0.66	-0.51	0.02
288 COUNTER AND FOUNTAIN WORKERS	-1.30	1.30	-0.66	-0.03	1.15	0.25	-0.23	-1.43	0.58
289 ELEVATOR OPERATORS	-0.91	0.40	-0.58	1.00	-0.19	0.42	-0.36	0.87	-0.18
290 HAIRDRESSERS AND COSMETOLOGISTS	-1.72	-0.90	-0.04	-0.82	1.36	-0.45	0.66	-0.38	1.19
291 HOUSEKEEPERS AND STEWARDS, EXC PRIV. HOUSE	-1.30	0.21	0.15	1.54	0.52	-0.03	0.41	0.19	0.19
292 JANITORS AND SEXTONS	-0.48	1.03	-0.81	1.47	-0.09	-0.47	0.39	0.42	-0.81
293 KITCHEN WORKERS, N.E.C., EXC PRIV. HOUSE	-1.39	1.30	-0.84	0.29	0.63	0.92	0.04	-1.02	-0.38
294 MIDWIVES	-0.19	1.71	-1.09	1.59	-1.01	0.70	-0.77	-0.25	-3.07

	1	2	3	4	5	6	7	8	9
295 PORTERS	-0.68	0.67	-1.04	0.44	-0.21	0.52	0.26	0.86	-1.26
296 PRACTICAL NURSES	-1.40	0.53	-0.12	1.29	0.24	0.39	-0.01	-0.16	0.06
297 FIREMEN, FIRE PROTECTION	2.20	-0.14	-0.39	-0.87	-3.73	-1.56	1.24	0.53	0.33
298 GUARDS, WATCHMEN, AND DOORKEEPERS	0.67	1.27	-0.41	2.27	-1.05	0.06	0.25	0.90	-0.26
299 MARSHALS AND CONSTABLES	0.84	0.71	-0.20	2.00	-1.16	-1.76	0.55	0.27	-0.47
300 POLICEMEN AND DETECTIVES	1.09	-0.54	0.33	-0.58	-2.08	-1.06	0.53	0.98	0.17
301 SHERIFFS AND BAILIFFS	0.78	0.05	0.39	1.30	-1.51	-1.04	0.58	0.91	0.15
302 WATCHMEN (CROSSING) AND BRIDGE TENDERS	-0.11	1.13	-0.84	1.78	1.14	-1.31	-1.23	-1.05	-1.10
303 USHERS, RECREATION AND AMUSEMENT	-0.24	3.94	-1.08	-1.28	0.83	0.56	-0.82	-3.67	0.50
304 WAITERS AND WAITRESSES	-1.62	0.76	-0.67	-1.15	1.03	1.04	0.31	-1.50	0.92
305 SEVICE WORKERS, EXC PRIV. HOUSE, N.E.C.	-1.01	1.60	-0.70	0.21	0.69	0.36	0.27	-1.07	0.12
306 FARM FOREMEN	0.61	0.44	-0.15	1.13	-1.13	-0.25	1.62	0.70	-1.12
307 FARM LABORERS, WAGE WORKERS	-0.64	1.94	-0.75	-0.06	0.37	1.19	0.82	-1.06	-1.71
308 FARM LABORERS, UNPAID FAMILY WORKERS	-0.93	2.27	-1.04	-0.34	-0.11	-0.76	-0.04	-3.20	-0.01
309 FARM SERVICE LABORERS, SELF-EMPLOYED	0.26	0.52	-0.51	0.78	1.05	0.14	1.04	-0.14	-0.77
310 CARPENTER'S HELPERS, EXC LOG & MINE	-0.25	1.39	-1.55	-0.95	1.33	1.94	-0.39	-0.04	-1.36
311 FISHERMEN AND OYSTERMEN	0.30	1.18	-0.69	0.45	1.32	1.41	0.64	-0.29	-1.48
312 GARAGE LAB'S & CAR WASHERS & GREASERS	-0.24	1.68	-1.56	-1.53	0.02	0.61	0.80	-0.17	-0.32
313 GARDENERS, EXC FARM, & GROUNDSKEEPERS	0.16	2.24	-0.60	0.87	0.15	0.70	0.16	-0.39	-1.19
314 LONGSHOREMEN AND STEVEDORES	0.50	-0.21	-0.98	0.48	2.03	-0.04	-0.66	0.19	-0.69
315 LUMBERMEN, RAFTSMEN, AND WOODCHOPPERS	-0.07	0.68	-0.92	-0.81	1.95	1.40	0.13	-0.46	-1.85
316 TEAMSTERS	0.42	0.64	-1.06	-0.37	1.63	-0.09	-0.02	-0.51	-1.56
317 TRUCK DRIVERS' HELPERS	0.04	1.32	-1.31	-0.91	0.57	0.91	0.03	0.25	-0.89
318 WAREHOUSEMEN, N.E.C.	0.75	0.56	-0.45	-0.54	-1.10	0.41	-0.45	1.51	0.17
319 LABS & K.W. (N.E.C.) SAWMILLS & OTHER WOOD	-0.43	0.31	-0.91	-0.54	1.10	0.98	-0.47	0.40	-1.27
320 LABS & K.W. (N.E.C.) FURNITURE & FIXTURES	-0.86	0.24	-1.65	-1.08	0.71	0.92	0.02	0.94	-1.06
321 LABS & K.W. (N.E.C.) STONE, CLAY & GLASS	0.03	0.03	-0.99	-0.90	0.65	0.89	-0.55	1.44	-0.92
322 LABS & K.W. (N.E.C.) PRIMARY METAL	0.68	0.12	-0.92	-0.40	0.99	0.48	-2.01	1.73	-1.25
323 LABS & K.W. (N.E.C.) FABR'D METAL	-0.03	0.21	-0.94	-0.62	0.45	1.35	-1.06	1.35	-0.45
324 LABS & K.W. (N.E.C.) MACHINERY EXC ELECT.	0.40	0.76	-0.98	-0.05	0.06	0.47	-0.81	1.47	-0.52
325 LABS & K.W. (N.E.C.) ELECTRICAL MACHINERY	-0.11	0.35	-0.72	-0.95	0.03	0.64	-1.61	1.60	-0.00
326 LABS & K.W. (N.E.C.) TRANS. EQUIP.	0.50	0.28	-0.99	-0.42	0.47	1.20	-1.56	1.25	-0.57
327 LABS & K.W. (N.E.C.) PROFESS'L, PHOTO & WATCH	-0.22	0.32	-0.37	-0.86	0.17	0.12	-1.10	0.90	0.74
328 LABS & K.W. (N.E.C.) MISC. MFG.	-0.64	0.59	-0.74	-0.43	0.52	1.22	-0.25	0.62	-0.25
329 LABS & K.W. (N.E.C.) FOOD & KINDRED	-0.27	0.69	-0.61	-0.58	0.30	1.83	0.10	0.62	-0.34
330 LABS & K.W. (N.E.C.) TOBACCO	-1.91	-0.03	-1.52	-0.75	0.40	3.54	-0.90	0.32	-1.74
331 LABS & K.W. (N.E.C.) TEXTILE MILLS	-1.63	-0.65	-1.31	-0.66	0.46	0.68	0.39	0.99	-1.30
332 LABS & K.W. (N.E.C.) APPAREL & OTHER TEXTILE	-1.47	0.50	-1.73	-1.34	0.94	1.07	-0.78	-0.26	-0.20
333 LABS & K.W. (N.E.C.) PAPER & ALLIED	-0.05	-0.00	-0.67	-1.13	-0.27	0.58	-0.74	1.60	-0.13
334 LABS & K.W. (N.E.C.) PRINTING & PUBLISHING	-0.40	1.28	-0.65	-0.84	0.23	-0.13	-0.53	-0.21	1.18
335 LABS & K.W. (N.E.C.) CHEMICALS & ALLIED	0.39	0.24	-0.79	-0.76	-0.49	0.29	-1.21	1.46	-0.85
336 LABS & K.W. (N.E.C.) PETROLEUM & COAL	1.48	0.41	-0.94	-0.46	-0.86	-0.87	-2.26	1.36	-0.65
337 LABS & K.W. (N.E.C.) RUBBER & PLASTIC	-0.04	-0.30	-0.80	-0.72	0.57	0.98	-0.81	1.14	0.07
338 LABS & K.W. (N.E.C.) LEATHER	-1.19	0.27	-1.43	-0.60	0.56	1.34	-0.98	1.04	-0.14
339 LABS & K.W. (N.E.C.) NOT SPECIFIED MFG.	-0.57	0.61	-0.92	-0.03	0.38	2.69	-1.38	0.97	-1.35
340 LABS & K.W. (N.E.C.) CONSTRUCTION	0.21	0.82	-0.80	-0.23	1.20	2.41	-0.06	0.52	-1.12
341 LABS & K.W. (N.E.C.) RAILROAD & RAIL EXPRESS	0.75	0.47	-1.19	1.33	-0.49	0.38	-2.05	1.82	-1.99
342 LABS & K.W. (N.E.C.) TRANS. EXC RAILROAD	0.39	0.89	-0.54	-0.61	0.28	1.16	0.09	0.65	-0.53
343 LABS & K.W. (N.E.C.) COMM. & UTIL.	0.20	0.46	-0.96	-0.04	-0.47	-0.25	-0.12	1.28	-1.23
344 LABS & K.W. (N.E.C.) WHOLESALE & RETAIL	-0.13	2.53	-1.36	-0.80	0.58	0.27	0.40	-1.30	0.32
345 LABS & K.W. (N.E.C.) BUSINESS & REPAIR	-0.06	1.59	-0.60	-0.60	0.77	0.95	0.35	-0.37	-0.25
346 LABS & K.W. (N.E.C.) PERSONAL SERVICE	-0.44	2.92	-1.03	0.88	0.72	0.88	-0.42	-2.04	-1.70
347 LABS & K.W. (N.E.C.) PUBLIC ADMINISTRATION	0.49	0.93	-0.46	0.58	-1.08	0.46	-1.21	1.44	-0.91
348 LABS & K.W. (N.E.C.) ALL OTHER INDUSTRIES	-0.41	1.93	-0.37	0.48	0.42	1.13	0.05	-0.40	-0.81

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